VISIT…

CHAPTER ONE

# *Deciding What to Believe*

When you read a newspaper or book, listen to someone speak, or even just think by yourself, you face decisions about what to believe. Should you accept a newspaper editorial's argument that smoking around nonsmokers violates their rights? Should you be persuaded by your professor's reasoning that plea bargaining in the criminal courts should be eliminated? Should you agree with a television commentator that certain drugs should be legalized? Should you alter your attitude toward abortion when a friend points out that it is inconsistent with some of your other beliefs? Should you be led by your own considerations to the conclusion that assisted suicide should not be made legal? You already evaluate arguments about issues like these every day. In this sense, critical reasoning—the subject of this book—is not entirely new to you. But this book will offer a collection of procedures that will enable you to carry out this activity more carefully and systematically. This should help you develop your own position on such issues more effectively.

Critical reasoning, then, is concerned with deciding what to believe, but this is not to say that critical reasoning *alone* can tell you what to believe. Critical reasoning is not a magical technique guaranteed to tell you whether to accept a particular belief in isolation. It does not operate in a vacuum. To decide whether drugs should be legalized, for example, you would need supporting information. You would probably want to know the extent of drug use under present laws, the nature of illegal drug trafficking and the harm it produces, the probable effects of different plans for legalization (Would drug use increase? By whom? How much?), and so on. But in evaluating what appears to be "information" on these subjects and in judging whether this information justifies taking a particular position on the issue, critical reasoning should play a crucial role.

The techniques of critical reasoning that we describe in this book assume that you already have many beliefs and that you use these beliefs to decide whether to accept new arguments presented to you. For example, suppose someone claims that drug use wouldn't increase significantly if drugs were legalized. You will be inclined to accept or reject this, depending on your beliefs about people—how tempted they are to use drugs, whether it is the threat of punishment that now keeps them from using drugs, and whether they would become more inclined to use drugs if the threat of legal punishment were lifted. If you believe that the threat of legal punishment has little to do with whether people use drugs, this would support the claim that legalization wouldn't result in higher drug use. Of course, you can always pursue the question further, asking whether a supporting belief is itself well supported. Why do you believe that the threat of punishment isn't what keeps people from using drugs? You could try to find out whether there is support for this belief, perhaps by looking at research done on why some people use drugs while others don't. Moreover, it is crucial for critical reasoners to be willing to give up some previously held beliefs if they appear to be inconsistent with claims that have better support.

The techniques of critical reasoning that we present here are not techniques for generating beliefs or cleverly presenting arguments. They are not techniques that tell you how to move from premises you now accept to conclusions you haven't yet considered. They are techniques for *evaluating* some beliefs in the light of others. By contrast, the detective in fiction is often depicted as "deducing" unexpected conclusions from a set of clues. Critical reasoning does not operate in this way. It is a procedure for judging beliefs, not for generating them. This can be seen as a task akin to editing a written text after it has been produced in first-draft form by yourself or others.[1]

Critical reasoning as we conceive it is both *active* and *open* to alternative points of view. We can describe our approach more clearly by contrasting it with two other kinds of activity: (1) *passive* reading or listening (as in the case of students who expect a lecturer to fill them with information) and (2) mere disagreement (as in the case of a combative person who is not willing to take seriously the reasons and opinions offered by other people).

1. The main focus of the text is on evaluating arguments rather than generating them. However, learning to restate clearly and then evaluate arguments is likely to improve the quality of the arguments you create, just as learning to edit any piece of writing helps you create better writing.

## Critical Reasoning Versus Passive Reading or Listening

Sometimes, when we listen to a lecture or read a book or an essay, we take each statement as information to be remembered. Suppose you are listening to a professor lecturing on the criminal courts. If your main purpose is to prepare yourself for a multiple-choice test, you might simply try to remember as many of her statements as you can: "Most criminal cases don't go to trial. About 90 percent of defendants plead guilty. Most legal scholars account for this high rate of guilty pleas as being the result of plea bargaining. If this is so, then eliminating plea bargaining would swamp the courts with cases." If you are taking notes, your mind will be active to the extent that you select some statements as worth writing down, and you probably group statements together under topical headings. But you are passive in the sense that you don't evaluate which of the professor's statements to accept and which to doubt or reject.

By contrast, critical reasoning demands a more fully *active* approach. First, in order to evaluate the lecturer's *reasoning,* you listen for structure: Are some statements presented as conclusions (for example, eliminating plea bargaining would swamp the courts) and others as supporting reasons (for example, plea bargaining results in guilty pleas)? Are some presented as explanations? What are they intended to explain? (Is the availability of plea bargaining intended to explain the high rate of guilty pleas?) Next, you examine the reasoning *critically*, that is, you evaluate or assess it: Has this conclusion been adequately supported? Do you have reason to doubt the supporting statements? Does the conclusion follow from them? Is this explanation adequate? These are some of the questions this book will address.

## Critical Reasoning Versus Mere Disagreement

In contrast to passive reading and listening, mere disagreement is critical as well as active, but it nevertheless lacks some essential features of critical reasoning. When we engage in mere disagreement, we are primarily negative in our criticism.[2] We are poised to reject that with which we disagree. We approach what we hear or

2. To some people the term "critical" and "criticism" are always negative. In this text, we allow, indeed promote, *positive* criticism. *Critical* reasoning as we conceive it is a positive activity, but also one that is not willing to take beliefs at face value. It involves continual willingness to re-evaluate our beliefs. It subjects them to critical scrutiny, not necessarily to reject them, but to determine whether they remain defensible in light of new information and new arguments advanced by yourself or others.

read with our own established beliefs in mind. We consider each statement presented to us and accept it, reject it, or hold it as uncertain, depending on how it squares with our prior set of beliefs. For example, if we are listening to the commentator discuss drug legalization, and we hear her say, "Many of the deaths associated with drug trafficking are the result of disputes between rival drug gangs," we might think, "OK, I agree with that." As we hear the further claim that, if drugs were legalized, the commerce of drugs could be regulated by law, we think, "Well I guess so." But as we hear the commentator arrive at the conclusion that some drugs should be legalized, we might make the judgment, "No, that's too radical, I've always been against drugs."

This process is active in that, as each statement is considered, a judgment is made. And the process is critical insofar as the judgments are evaluative (some statements are accepted, some are rejected). But critical reasoning differs from mere disagreement in certain crucial ways.

Mere disagreement is applied to separate, individual statements, and they are judged solely against the background of the reader's or listener's own beliefs. Critical reasoning, by contrast, requires us to examine the argumentative structure of an entire commentary, taking some statements as justifications for believing others. Rather than judging someone's main thesis and evaluating it on the basis of our prior beliefs alone, critical reasoning requires that we be open to having our minds changed. Even if we would have disagreed with a particular claim initially, we might be persuaded by the remainder of the commentary to believe it. Critical reasoning opens us to changing our beliefs; it involves looking at reasons on which a point of view is based, judging whether these reasons are strong enough to justify accepting this point of view, and altering our beliefs if a better alternative is presented.

Moreover, as we conceive it, critical reasoning is more concerned with revising our own systems of beliefs than in being critical of other arguers. If we focus on the word "critical," it is easy to construe *critical reasoning* as finding fault with other people's arguments. But this is not our primary objective. We distinguish between (1) the task of interpreting and clarifying the arguer's thinking with the aim of helping the arguer see any mistakes that might have occurred and (2) of using the presentation of an argument as an occasion for deciding what to believe. Although many of the techniques we discuss apply to both, we will focus on the second.

## The Attitude of the Critical Reasoner

This activity of critical reasoning typically carries with it an attitude quite different from that of the person engaged in mere disagreement. When we engage in

mere disagreement, we seek to maintain the same beliefs we held prior to considering a new position. When we engage in critical reasoning, we cultivate an attitude of relative detachment. If an arguer points out that reasons we ourselves would accept really support a specific conclusion and therefore would compel us to give up some conflicting view we hold, we see this as a gain, not a loss.

If we have been against abortion, but someone points to beliefs we also hold that would rationally compel us to the view that a fetus should not be considered a person, as critical reasoners we would embrace this view, even though it threatens our antiabortion position. And the same can be said if we are in favor of allowing abortion and we are given good reasons for taking the fetus to be a person. The object is not to "save face" by attempting to justify past beliefs but to embrace whatever is most reasonable now. We are committed to being consistent and to following reason wherever it leads.

An issue like abortion typically reduces potential reasoners to mere disagreers. Because the issue is heartfelt and because those on both sides tend to see their opponents as villains, it is difficult to accept a point that might give support to the opposing view, even if there is good reason to accept it. The object becomes "winning" the argument by making the opposition look and sound bad. Critical reasoning by contrast seeks to take reasoning out of this competitive arena, where in the extreme the competitors seek to dominate and even humiliate each other. If an arguer points out that reasons we ourselves would accept really support an unanticipated conclusion, and therefore should compel us to give up some conflicting view we hold, we see this as a gain, not a loss.

## Self-Identity: Two Options

These two attitudes—the mere disagreer's attitude of wanting to sustain past beliefs and the critical reasoner's attitude of wanting to judge what should be believed—correspond to two ways of viewing ourselves. I might associate what I truly am with my present set of beliefs. Then, if I find that I was mistaken about something, I must admit that until now my self has been defective—a difficult thing to do. In this situation, it is important for me to always be right and not to have to change my beliefs or learn from someone else. Maintaining this attitude will hold me at the level of mere disagreement.

On the other hand, I might identify myself more closely with the belief-forming process itself. Rather than characterizing myself in static terms, by the set of beliefs that I try to maintain, I can think of myself dynamically as actively engaged in replacing less adequate beliefs with more adequate ones. A tradition of active, critical, and open discourse with others is associated with the philosopher

Socrates.[3] Socratic method or Socratic dialogue involves constantly scrutinizing beliefs and asking whether they are justified by the reasons put forward in their support. We would add that this process is as important in our dialogues with ourselves as with others.

I can characterize myself as the kind of person who takes pride in carrying out this activity well. Critical reasoners are like athletes engaged in the activity of their sport. Mere disagreers are more like bodybuilders, taking pride in the static features of their bodies, not in how their bodies perform.

## Some Common Misconceptions About Critical Reasoning

We believe there are certain misconceptions about critical reasoning that make some students leery of the enterprise. Perhaps the most common misconception is that critical reasoning locks us into rigidly structured patterns of thought. It is associated with "being logical," which calls up a picture of moving from proposition A to proposition B to proposition C in a mechanical, almost unhuman way. This "linear" way of thinking is sometimes contrasted with a spontaneous, creative, free-and-easy manner of thought that sounds much more appealing.

This picture of critical reasoning and its effects on the mind is a mistaken one. It is true that in learning to evaluate arguments you will begin to look at the patterns formed by the statements that make up arguments. But learning to do this will not suddenly make the thoughts that come into your head fit into patterns. You may get your ideas any way you want; critical reasoning won't have any effect on this. Your thoughts might float through your head in any order, mixed with the wildest fantasies and daydreams—critical reasoning has nothing to say about this. But if, on some later occasion, you wish to evaluate a certain thought that occurred to you, you might then need to fit it and certain other thoughts into a pattern. Critical reasoning doesn't tell you to spend a large portion of your mental life doing this, but if and when you want to evaluate a statement that you have considered or that someone else has offered, at that time you will need to consider whether there are other statements that adequately support the one in question. This involves looking at the pattern of the statements in the process of assessing and editing your beliefs.

The notion that a person thinks either logically or nonlogically all the time, and that learning to reason will transform you from doing the latter to doing the former, is preposterous. If thinking nonlogically means thinking spontaneously, freely, in no imposed order, then everyone thinks nonlogically a good deal of the time, and no one would want to stop doing so. But on some occasions, everyone

3. Socrates (470–399 B.C.) was a Greek philosopher. The Socratic tradition of critical reasoning springs from a series of dialogues by his follower Plato (427–347 B.C.) in which Socrates is the central character.

needs to determine whether a certain belief is well supported and worth holding. On these occasions, there is really no choice about whether to do this logically or nonlogically. Critical reasoning, in other words, is something we all do some of the time. The question is how to do it better.

Another common misconception about critical reasoning is that it supposes there is a right and wrong point of view. Some people are more attracted to the notion that each person has his or her own way of looking at things and one way is no better than another. Actually, engaging in critical reasoning doesn't force you to assume that there is always a single correct position on an issue. It could be that more than one position can be held equally reasonably. We do not assume that the truth can always be known, or even that it can ever be known with certainty. But to engage in critical reasoning is to assume that at least sometimes one point of view can be seen to be more reasonable than another. We also assume that it is sometimes more reasonable to doubt a certain position than to believe it.

Perhaps the notion that one person's opinion is always as good as another's seems the more humane and tolerant attitude. A more thorough assessment of this relativism will be given in the final chapter of this book. For now it is worth noting that this attitude has a profound and dangerous consequence. If one holds that there is no way of determining what is reasonable to believe—that one opinion is always as good as another—then, when it comes to deciding what belief to act on, what procedure is available for making this decision? If it is assumed that no opinion can be shown to be more reasonable than another, it is a short step to the view that the only final appeal in settling differences is an appeal to force.

## Benefits of Critical Reasoning

What is to be gained from approaching disputes as opportunities to improve your set of beliefs rather than as contests? Many people enjoy winning arguments, and they would be disappointed to learn that studying critical reasoning won't prepare them to win more arguments. Nevertheless, there are several points to consider in favor of critical reasoning.

First, not all disputes in which you engage are with other people. Perhaps the most important dialogues that occur in your mental development are with yourself. If you have acquired the habit of arguing with others only for the purpose of winning, you have not prepared yourself adequately to reason well in these dialogues with yourself. There are sidetracks along which an individual can be drawn, just as a pair of people can be drawn away from reason and into competition and toward attempts to dominate. In a conversation with yourself, unless habits of reasoning have been well established, it is easy to choose the position that is the most comfortable or the most self-serving, rather than the one that is the most reasonable.

Second, from a broader perspective, the practice of critical reasoning can promote substantial social values. Perhaps foremost among them is the defense it can provide against our vulnerability as citizens in a society increasingly ruled by experts. Even though we might not be experts ourselves, we can mitigate our status as amateurs by honing our reasoning skills. Moreover, our guiding assumption in promoting critical reasoning is that our beliefs form the basis for our actions, and the better justified our beliefs, the more appropriate to the world our actions will tend to be.

### Exercise 1.1 Taking Notice of Disagreements and Reasoning

1. Write a short account of a dispute that you overheard or one in which you participated recently. State whether you think anyone's point of view was changed as a result of reasons presented by the opposition. If not, why not? To what extent did the exchange consist of mere disagreement, and to what extent reasoned criticism?
2. When you enter into a discussion, you are likely to find that there are many factors that might promote or discourage critical reasoning. For example, you might be more inclined to reason with a peer than with a parent, or with someone who acknowledges some of your points rather than someone who rejects everything you say. Your arguments might receive a better hearing if you're sitting across from someone than if you are standing over him or her.

   Make a list of factors that tend to encourage critical reasoning and factors that tend to discourage it. Next underline which of these factors you can control. You might consider strategies for controlling these factors when you try to engage someone in a critical dialogue. (This is a good exercise for collaborative discussion in small groups.)
3. Consider the situations of a courtroom trial and a formal debate. Contrast the procedures followed in these situations (as you understand them) to the procedures of reasoned criticism outlined in this chapter.

## The Main Techniques of Critical Reasoning

Thus far we have claimed that critical reasoning is a process that emphasizes a rational basis for belief and provides a procedure for resolving disagreements by means of further inquiry. And we have contrasted critical reasoning to a mere disagreement or quarrel in this respect. We now indicate briefly some of the ways

critical reasoning can accomplish its ends. This overview also introduces the materials contained in chapters 2 through 11.

We can illustrate the main techniques of critical reasoning by applying them to the following lecture fragment on the subject of plea bargaining. Suppose you have taken notes, and you now want to critically evaluate what has been said. How do you structure what you have heard in a way that prepares you to evaluate it fruitfully? What should you accept of what has been said? What should you call into question? Why? These are the kinds of questions we hope to prepare you to answer for yourself in the chapters that follow.

**First Argument**

**Second Argument**

**Lecture Fragment on Plea Bargaining**

Plea bargaining (agreeing to plead guilty in exchange for a reduced sentence) generates problems. Innocent defendants who can't afford bail may plead guilty just to avoid jail time waiting for trial. The process makes no presumption of innocence. Guilt is not determined in an adversarial process, it is negotiated. It makes work easier for prosecutors, defense attorneys, and judges, but it sometimes results in dangerous offenders receiving less jail time than they otherwise would.

Given these problems, some have suggested that plea bargaining be eliminated. But this might create an even worse problem. Ninety percent of defendants plead guilty, and most of those do plea-bargain. Suppose plea bargaining were eliminated and the percentage of guilty pleas dropped to 80 percent. This would double the number of criminal trials, placing a staggering burden on the criminal justice system. The practice of plea bargaining should be continued if eliminating it might have this disastrous result.

The experience of Alaska, however, calls this fear into question. Alaska has virtually done away with plea bargaining. There was some increase in the number of trials, but not as much as expected. In the year before elimination of plea bargaining, there were seventy-two felony trials in Fairbanks. In the year after, there were ninety. This is only a 25 percent increase.

Why was the increase so small? The explanation of why defendants plead guilty could be because most of them are factually guilty, and they don't have a viable legal argument for their defense (i.e., they are legally guilty as well); so they believe it is unlikely that they would win in a trial. If this is the case, then, as Alaska's experience indicates, while it may be difficult to eliminate plea bargaining, it is not impossible.

What arguments can we find in the lecture fragment on plea bargaining? If we survey the passage, we can see that the first paragraph contains reasons in favor of the conclusion that plea bargaining should be eliminated. The second

paragraph presents reasons supporting the opposite conclusion—that plea bargaining should not be eliminated. The third and fourth paragraphs cast doubt on the second argument; they suggest that the reasons given for keeping plea bargaining may be weak. The last statement of the passage (". . . while it may be difficult to eliminate plea bargaining, it is not impossible") indicates that the lecturer is supporting the first argument and rejecting the second.

In applying critical reasoning to this passage, you will want to decide for yourself whether to accept the first argument and reject the second. To do this, you will first need to restate each argument clearly, listing all the reasons (premises) and the conclusion for each.[4] Often, this requires rewriting parts of the passage in a more clear, direct manner. For example, the first argument might be stated in the following way:

**FIRST ARGUMENT (AGAINST PLEA BARGAINING)**

Premise 1. Plea bargaining may cause innocent defendants to plead guilty.
Premise 2. Plea bargaining makes no presumption of innocence.
Premise 3. Plea bargaining results in guilt being negotiated.
Premise 4. Plea bargaining sometimes results in dangerous offenders receiving less jail time than they otherwise would.
Conclusion: Plea bargaining should be eliminated.

**SECOND ARGUMENT (FOR PLEA BARGAINING)**

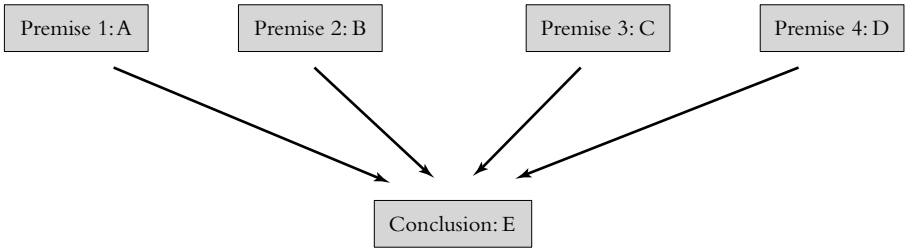
Premise 1. Eliminating plea bargaining might overwhelm the court system with criminal trials.
Premise 2. If eliminating plea bargaining might overwhelm the court system with criminal trials, then it should not be eliminated.
Conclusion: Plea bargaining should not be eliminated.

Notice that there is a difference between these two arguments. The first presents several independent reasons for its conclusion. Each premise by itself carries some weight in supporting the conclusion that we should eliminate plea bargaining. By contrast, the second argument gives two *linked* reasons for its conclusion. The first premise is a reason by itself in support of the conclusion, but the second is not. Rather it links the first premise to the conclusion. We might represent the difference between these two kinds of arguments by diagramming the premises in two different ways—horizontally and vertically, as we do on the following page.

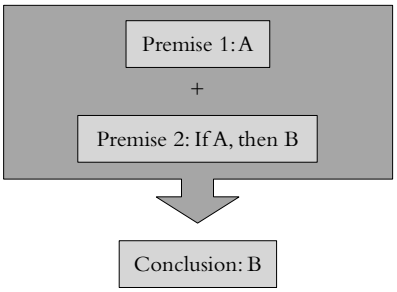
After a general discussion at the beginning of chapter 2 on the nature of arguments and kinds of arguments, chapters 2 through 7 will focus on arguments like argument 2—ones with premises that are linked together so that (if they are successful) the conclusion follows necessarily from all of the premises. These are called *deductive arguments.* These chapters discuss in detail how to reconstruct and

4. Reasons offered in support of a position are conventionally called "premises"; the position being supported is called the "conclusion."

**Argument 1: Independent Premises**




**Argument 2: Linked Premises**




evaluate them. We present evaluation as a two-step procedure of asking the following: (1) whether the conclusion follows from the premises and (2) whether the premises themselves should be believed. These basic steps are initially discussed in chapter 4. Chapter 5—which is optional—is a more detailed account of how we can determine whether an argument's conclusion follows from its premises. It introduces elements of reasoning studied by an area of philosophy called logic and taught in classes on symbolic logic. Our approach to critical reasoning downplays this formal approach and offers instead a collection of less conventional procedures that will be useful in a variety of contexts, such as the identification of fallacies (chapter 6) and the examination of how the soundness of arguments can depend on definition and meaning (chapter 7).

Chapter 8 discusses arguments that are not deductive. The premises of these arguments provide some support for their conclusions, but the conclusions do not follow necessarily. This includes those like argument 1 (which we call convergent), arguments by analogy, arguments based on statistical premises, and arguments based on data (traditionally called inductive). Paragraphs 3 and 4 of the lecture fragment on plea bargaining can be seen as generalizing from particular

data. The particular case of Fairbanks, Alaska, in which felony trials increased only 25 percent, is used to suggest that it may not be impossible to eliminate plea bargaining generally (that is, in other states as well). Chapter 8 will give you a procedure for judging whether generalizations such as this are warranted.

Chapter 9 extends the discussion of critical inquiry to the topic of theories. Theories are often set forth either as premises of arguments or as explanations of why certain patterns occur in the observable world. Evaluating theories sometimes requires specialized knowledge, but we present some general procedures that are helpful in understanding many theories and provide a way to begin evaluating them.

The lecture fragment can be interpreted as presenting two theories, both intended to explain why most defendants plead guilty. The first theory (suggested in paragraph 2) supports the argument that plea bargaining should not be eliminated. According to this theory, most defendants plead guilty simply because they are offered a lesser sentence under plea bargaining than they would stand to get if they went to trial. The second theory is presented in paragraph 4. In essence, this theory claims that defendants plead guilty because they are guilty. The techniques described in chapter 9 will help you reconstruct these theories more precisely and understand how to evaluate them. This reconstruction in turn will help you choose between the two opposing arguments presented in the lecture.

Sometimes we feel unqualified to judge what we hear and read because we lack expertise. In the case of plea bargaining, for example, we might feel tempted to leave the matter to specialists in the field of criminal justice and simply adopt the views of those specialists. However, taking this approach raises difficulties of its own. How do we know who to count as experts in a particular field? What do we do if the experts disagree? How do we avoid being controlled by experts? The difficulties we face in making decisions based on theories and arguments proposed by experts and specialists is the subject of chapter 11.

Throughout this book's treatment of all of these topics, a strong underlying purpose of *Critical Reasoning* is to provide procedures for determining what is reasonable to believe. When presented with an argument or theory, one might take it as an occasion for a contest, an occasion for defending prior beliefs and defeating anything that contradicts them, or as an opportunity to determine whether past beliefs are inadequate and should be modified. Our basis for urging the latter course is the proposition that there is more to be gained by building a more reasonable set of beliefs than by winning contests when disagreements occur.

## Exercise 1.2 A Beginning Step: Identifying Main Points and Supporting Points

1. Putting an argument that you hear or read into your own words is an important step in critical reasoning. We will be discussing how to do this in detail

throughout the book, but as a start, for each passage (a) write what you take to be the author's main point and (b) list any claims the author makes that support this point. Set aside for the moment your own position on the issues raised, and try to capture the author's position as best you can. It is often useful to simplify a passage, eliminating what is inessential and simplifying cumbersome statements.

a. America has got to keep good-paying jobs in this country because it needs to narrow the gap between the very wealthy and the rest of us. In the last decade, the difference between the wealthiest 20 percent and the poorer classes has expanded drastically. If the differential becomes too great, American democracy is at risk. We can only hope to reverse this dangerous state of affairs if we keep jobs in this country that pay wages adequate for workers to support their families.
b. People are dying all over the United States as victims of the drug war. The lives of these victims are often destroyed, if not by drugs themselves, then by a disease like AIDS that often comes with drug use. But of course, drug users are not the only victims. The drug trade brings with it the violence we see in cities all over the United States. Gangs supported by drug money bring terror to the streets. But our political system is also a victim. The truly incredible amount of money available to drug kingpins inevitably leads to corruption among the police and in the government. The fabric of the country is in danger. The war on drugs is one of the greatest problems the country will face over the next decade.
c. The abortion issue seems to be in the news practically every week. There are rallies and political speeches. Various candidates are jockeying for political advantage by embracing one side or the other on this controversial issue. Abortion raises some fundamental issues that bring into conflict our very conception of humanity and our ideals of liberty. In spite of the importance of the topic, abortion should not be made the central issue in political campaigns. Candidates for public office differ in a variety of ways, some of which are more important to the fate of the country than abortion policy is. If we do not adequately deal with problems such as medical coverage and crime, both our ideals of humanity and our liberty will be threatened. There should be no "litmus test," no single criterion, in judging people for public life in our complex and increasingly vulnerable world.
d. Honesty is on the decline in the United States. Increasing numbers of people admit that they lie on a regular basis at work and at home. These lies are not just minor omissions, trivial untruths designed to save another's feelings, or even lies in the "traditional domain" of sexual behavior. Many workers indicate that they regularly lie at work. This change in American attitudes began with President Johnson's denial that he would

expand the war in Vietnam, right before he did just that. It was fostered by the lies leading to Nixon's resignation as president. The belief that politicians at all levels of government will not tell the truth has only grown. President Clinton's revelation that he did not tell "all the truth" about his sexual behavior just confirmed what was a widespread expectation that politicians and other public figures routinely lie. Why do public figures, as well as the rest of us, feel that they need to lie? The real reason is that Americans—in their private, public, and workaday lives—are not willing to hear the truth. The voters don't want to be told that big tax cuts will result in decreased public service. Bosses don't want to be told that their favorite plans are likely to fail. And friends don't want to hear that their binge drinking is interfering with their lives. If this trend continues, the fabric of the country is in danger. We all need to be willing to face the truth as citizens, as employees, as friends. If we stop penalizing others for telling the truth, then they will be more willing to be honest in what they say.

2. Review your notes from a lecture that you heard recently. In your own words briefly state the most important points.

3. As a starting point in developing your reasoning skills, it will be useful for you to produce a short piece of writing. This exercise will be used later to help you improve your writing. In a paragraph or two, express a position on one of the following issues and support it:

   a. censorship
   b. capital punishment
   c. abortion
   d. use of alcohol or other drugs
   e. marriage
   f. single parenting
   g. gun laws
   h. building new prisons
   i. the prospects for your generation

4. Read both of the accompanying editorials. For each one, consider what is the main point. Some candidates are listed below. If you think of another way of stating the main point for either editorial, write it out.

   Some candidates for the main point of the editorial *Truth about 'assistance':*

   a. Many people who want assisted suicide are not terminally ill.
   b. Assisted suicide would lead to helping people die who are depressed and might later want to live.
   c. Advocates of assisted suicide are trying to mislead us.
   d. Assisted suicide should not be made legal.
   e. Assisted suicide is morally wrong.

Some candidates for the main point of the editorial *No Right to Cause Death:*

a. Smoking causes harm to bystanders.
b. Smoking poses a risk to the health of bystanders.
c. Smoking violates the rights of nonsmokers.
d. Those who smoke around nonsmokers violate nonsmokers' rights.
e. Smoking should be more tightly restricted.
f. Smoking is wrong.

5. For each of the accompanying editorials, state in your own words one or two points that support the main point. Try to determine whether the supporting points are convergent, as in argument 1 on page 11, or linked, as in argument 2 on page 11.

**Truth about 'assistance'[5]**

**There are many good reasons respected groups oppose suicide. Here are some of them.**
By Wesley J. Smith

To paraphrase the old musical classic, assisted-suicide advocates are great pretenders.

They promise that it will be restricted "as a last resort" to mentally competent, terminally ill people. They argue that the killing will be facilitated only by supercareful Marcus Welby clones. They promise that the entire practice will be strictly controlled and, above all, compassionate.

Balderdash. Let's open our eyes to the truth.

▶ Assisted suicide is not about terminal illness.

Jack Kevorkian epitomizes what actual assisted-suicide practice would look like. Approximately 20% of his subjects (his term) have been terminally ill. The largest category of people he has helped to die were disabled. Three had no physical illness on autopsy.

That's not all.

The 9th Circuit Court of Appeals decision, now before the Supreme Court, specifically held that the disabled "will, along with non-impaired individuals, be beneficiaries" of legalized assisted suicide.

Moreover, the court ruled that "a decision by a duly appointed surrogate decision maker is, for all legal purposes, the decision of the patient himself." This means that if upheld, it would allow the permissible, nonvoluntary killing of those who are legally incompetent, which could include Alzheimer's patients, mentally retarded people and, perhaps, children.

5. Wesley J. Smith, *USA TODAY,* 9 January 1997. Reprinted with permission of the author. Wesley J. Smith is an attorney for the International Anti-Euthanasia Task Force and author of the upcoming book, *Forced Exit.*

▶ It is not about compassion.

Studies show that suicidal people who are dying or disabled are no different from those who want to die because of, say, a lost business or divorce. Almost all are clinically depressed.

We will interfere with the jilted lover's "right to die," by force if necessary. Yet we are supposed to allow doctors to assist the suicides of persons with multiple sclerosis or cancer when next week or next month they might regain the desire to live.

That isn't compassion; it is the ultimate in abandonment.

▶ Follow the money:

Headlines announce almost daily the pressure that for-profit HMOs place on doctors to reduce the cost of health care.

Plug legalized assisted suicide, which is far cheaper than long-term care, into the HMO equation.

Imagine "choosing" assisted suicide because your HMO denied you adequate access to specialists in pain control or appropriate treatment for depression. It could happen.

Or think how you would feel if an HMO doctor recommended suicide as the best "treatment" for your spouse, and you knew that the doctor could be fired or lose bonus income for providing your beloved with too much care but would be financially untouched for assisting in his or her suicide.

These are just a few of the many reasons the American Medical Association, the Hospice Nurses Association and the Clinton administration, among many diverse others, have filed briefs in the Supreme Court against legalizing assisted suicide.

It's time to stop pretending, open our eyes, and see assisted suicide for what it really would be: a moral and ethical catastrophe.

**No Right to Cause Death**[6]

The rationale for granting smokers the "right" to spread their toxic fumes around has disappeared. Diehards, egged on by the tobacco companies that supply them, have long tried to cast their habit as a civil liberties issue, claiming they should be free to engage in a practice that harms no one but themselves.

But the evidence is now overwhelming that smokers endanger all those forced to inhale the lethal clouds they generate. That makes smokers at least a small hazard to virtually all Americans—and a fitting target for tighter restrictions.

Evidence that smoking can harm nonsmokers has been accumulating for the last decade. In 1986, two of the nation's most prestigious health authorities—the National Academy of Sciences and the Surgeon General—concluded that fumes generated by smokers can cause lung cancer in adult nonsmokers and respiratory problems in the children of smokers.

Now, in a comprehensive study covering more than twice the data available in 1986, the Environmental Protection Agency has concluded that smoking is indeed a serious and substantial health risk for nonsmokers, particularly children.

Each year environmental tobacco smoke probably causes some 3,000 lung cancer deaths in the U.S., 150,000 to 300,000 cases of respiratory infections in infants and young children, and a worsening of symptoms in 200,000 to 1 million asthmatic children. Maternal smoking seems to be implicated in Sudden Infant Death Syndrome, a frightening condition in which babies die inexplicably in their cribs at night. And other studies not assessed by the E.P.A. have suggested that environmental tobacco smoke may cause heart disease and cancers at sites other than the lung.

The E.P.A. marshals an enormous array of evidence to build an overwhelming case that tobacco smoke is hazardous to innocent bystanders. The smoke that emanates from a smoldering cigarette contains virtually the same cancer-causing compounds as the smoke inhaled by the smokers. The inhaled smoke is known to cause cancer; it would be astonishing if the environmental smoke were not carcinogenic as well.

The main difference is that bystanders take in a more diluted mixture—and they have no choice in the matter. Smoking does, therefore, involve the violation of rights, and it is the smokers who are the violators.

The clinching evidence that environmental smoke causes lung cancer

6. Editorial, *New York Times,* 10 January 1993. Copyright © 1993 by the New York Times Company. Reprinted by permission.

comes from studies of the health damage suffered by nonsmoking spouses of smokers. Seventeen of these studies were able to distinguish which spouses got the biggest doses of environmental smoke. In every study, the highest exposure group had an increased risk of lung cancer, and in nine the increase was statistically significant, or almost certainly meaningful. The odds of this happening by chance are less than 1 in 10 million, the E.P.A. says.

The Tobacco Institute, the trade group for the industry, has countered with sophistry. It contends that two-thirds of 30 or more studies reviewed by the E.P.A. show no "statistically significant" increase in lung cancer risk. That is true, but one-third of the studies do show significance, and the combined results are persuasive.

The Institute also complains that the E.P.A. has loosened its statistical standards so that it is only 90 percent confident of its conclusions instead of 95 percent confident, the standard often used. That, too, is true. But a panel of distinguished scientists endorsed the approach as appropriate given the enormous array of data on tobacco smoke and the certainty that the smoke is not beneficial. The continued effort of the Tobacco Institute to get Americans to ignore the best available science represents corporate irresponsibility of the rankest sort.

The only real issue is how serious one should consider the environmental hazard. The spouses of people who smoke at home might face a 1-in-500 chance of developing lung cancer, the E.P.A. suggests. That is far less than the 1-in-10 to 1-in-20 chance faced by the smokers themselves. But it is far more than society tolerates for exposure to other cancer-causing chemicals.

No one would grant his neighbor the right to blow tiny amounts of asbestos into a room or sprinkle traces of pesticide onto food. By the same logic, smokers have no right to spew even more noxious clouds into the air around them. The next step has to be a searching examination of how to tighten restrictions on smoking in all public places, and the workplace as well.

CHAPTER TWO

# *The Anatomy of Arguments: Identifying Premises and Conclusions*

When someone gives reasons to support a point of view, that person is usually offering an *argument*. You encounter arguments in your reading and in your conversations with others, and you commonly offer arguments to support your own beliefs. When you are presented with an argument, you can take the opportunity to decide whether the reasons given are good enough to warrant incorporating the point of view that is being advanced into your own set of beliefs. To make this decision, you need to clearly understand the argument and then evaluate it.

The main focus of this and several of the following chapters is a kind of argument called *deductive.* But before we begin our study of deductive arguments, we should provide a broader view of arguments, including nondeductive arguments. Since an argument gives reasons (one or more) in support of a point of view, both of the following examples would surely count as arguments. In each of them, at least one reason is given to support a point of view.

***Example 2.1***

***Deductive Argument***

*Eliminating plea bargaining might overwhelm the court system with criminal trials. If it would do this, then plea bargaining should not be eliminated. Therefore, plea bargaining should not be eliminated.*

***Example 2.2***

***Informally Stated Argument***

*Auctioning the eggs of fashion models encourages parents to fixate on their child's physical appearance. So auctioning the eggs of fashion models promotes an unhealthy attitude.*

Although these examples give reason(s) in support of a viewpoint, important differences exist between them. Example 2.1 has a form or structure that makes the conclusion follow necessarily from the premises. That is, if the premises are true then the conclusion must be true. It's an example of a *deductive argument*.

If an argument doesn't already have a structure that makes the conclusion follow from the premises, we could try to restate it so that it does have such a structure. For example, we could treat Example 2.2 as being a fragment of a longer, more complete, deductive argument.

***Example 2.2 Restated as a Complete Deductive Argument***

*Auctioning the eggs of fashion models encourages parents to fixate on their child's physical appearance.* ***Fixating on one's child's physical appearance is an unhealthy attitude.*** *So auctioning the eggs of fashion models promotes an unhealthy attitude.*

When we add the middle (boldfaced) sentence to Example 2.2, we are restating it in a way that makes the conclusion—auctioning the eggs of fashion models promotes an unhealthy attitude—follow necessarily from the premises. Some might claim that the middle sentence is already *implicit* in the original example. If this is taken to mean that anyone who asserts the original argument must have "had in mind" the unstated premise: *Fixating on one's child's physical appearance is an unhealthy attitude,* then we are not committed to this view. We aren't guessing what the arguer had in mind. Rather, when we add this premise to create a complete deductive argument, we are trying to make it easier to decide whether to accept the argument's conclusion. By adding the unstated premise, we can see all of the statements we would have to judge as acceptable or unacceptable in order to decide whether this argument compels us to accept its conclusion. The premises of a deductive argument are like a checklist: Is it reasonable to believe that auctioning fashion models' eggs encourages parents to fixate on a child's appearance? Is it reasonable to believe that this is an unhealthy attitude? If there are no reasonable grounds for rejecting either of these claims, then I am driven to the conclusion that auctioning the eggs of fashion models promotes an unhealthy attitude.

For the next several chapters, our general approach will be to interpret arguments as deductive. If they are not stated as complete deductive arguments, we will try to restate them so that they are. Later chapters will study certain kinds of arguments that, for purposes of evaluation, might be best interpreted as nondeductive. If an argument is *nondeductive,* its conclusion doesn't necessarily follow from its premises. If the argument is successful, its premises provide *some support* for the conclusion; but even if the premises are true, the conclusion could be false.

Examples 2.3, 2.4, and 2.5 could all be taken as nondeductive. Example 2.3 gives three reasons against legalizing physician-assisted suicide. These reasons could be presented as having *some weight*, even if it doesn't follow necessarily that physician-assisted suicide should be illegal. The argument might be taken as leaving open the possibility that considerations in favor of legalization outweigh considerations against it.

## Some Types of Arguments

***Example 2.3***

***Convergent Argument***

*Lagalizing physician-assisted suicide would lead to (1) helping disabled people die who are not terminally ill, (2) helping people die who are depressed and might later want to live, and (3) helping people die in order merely to save medical expense. These are all reasons against legalizing physician-assisted suicide.*

***Example 2.4***

***Inductive Argument***

*The rate of violent crime fell last year in a sample of fifty U.S. cities and towns, so the rate problably fell in the nation as a whole.*

***Example 2.5***

***Argument from Analogy***

*The universe has an order and precision similar to a clock's. Since the clock had a maker, the universe probably had a maker.*

Of course, this example could also be interpreted as a deductive argument that is not completely stated. It could be taken as having the implicit premise that if legalizing physician-assisted suicide would have these three results, then it should be kept illegal. The conclusion that physician-assisted suicide should be kept illegal would then follow necessarily. In the next several chapters, we will interpret arguments such as Example 2.3 as deductive, but in chapter 8 we will introduce an alternative way of viewing them: that is, as a kind of nondeductive argument sometimes called *convergent*.

Example 2.4 is typical of a kind of argument called *inductive.* Its premise describes a characteristic found in a sample (fifty U.S. cities and towns). The conclusion asserts that *probably* this same characteristic—a decline in the rate of violent crime—is true of a larger population (the nation as a whole). The fact that this conclusion asserts only a probability is what makes this kind of argument nondeductive. Example 2.5 is called an *argument from analogy.* It argues that two things are alike in certain respects, so they are probably alike in some further respect. As with the previous example, the conclusion—the universe had a maker—is asserted as probable only, not as necessarily following from the premise, so this, too, is best interpreted as a *nondeductive* argument.

All five examples, then, constitute *arguments* in the broad sense that they give one or more reasons in support of a point of view. The reasons are called *premises,* and the point of view being supported is called the *conclusion.* Chapter 8 will provide techniques for understanding and evaluating nondeductive arguments. We now turn to the task of identifying premises and conclusions of deductive arguments.

## The Key to Identification: Seeing What Is Supported by What

To understand deductive arguments fully, you first need to learn to identify their parts—the **premises** and the **conclusion**. Ultimately, understanding them will help you to evaluate arguments better. As in medicine, you must learn the anatomy of an animal before you can systematically diagnose its ills and improve its health.

We will begin our investigation of premises and conclusions by looking at short, simplified passages that contain arguments. For example, a reader of the editorial on smoking reprinted at the end of chapter 1 might restate one of its arguments in this way:

***Example 2.6***

*If smoking poses a risk to the health of bystanders, then it violates their rights. Smoking does pose a risk to the health of bystanders. Therefore, smoking violates the rights of bystanders.*

The first two statements support the third. They provide reasons for believing that smoking violates the rights of bystanders, so each one individually is a premise of the argument. The conclusion is the statement that the premises are supposed to support: Smoking violates the rights of bystanders.

Consider a second example. Suppose someone who doesn't know much about biology argues as follows:

***Example 2.7***

*Whales are not mammals, since no fish are mammals, and whales are fish.*

In this argument the premises and the conclusion are not given in separate sentences, but we can nevertheless distinguish what is supported from what is offered as support. The first clause, *whales are not mammals*, is supposed to be supported by the two clauses that follow: *no fish are mammals* and *whales are fish*. The latter two statements are the premises, and the first statement, whales are not mammals, is the conclusion. This conclusion happens to be false, but it is nevertheless the conclusion of the argument—a faulty argument in this case.

Two cautions are in order: (1) Some people misconstrue the conclusion as a mere summary of the premises. The conclusion of an argument does not, however, simply restate the sentences in a passage. (2) Others tend to think of the conclusion as the most important point in the passage. Often it is, but it need not be. The conclusion can be singled out because it stands in a special relationship to the other statements—that is, it is supposed to be supported by the other statements. To find the conclusion in a passage, we must see which statement is supposed to be supported by the others.

## Clues to Identifying Argument Parts: Indicator Words

Sometimes the person offering an argument provides clues that identify the premises and conclusion. Consider the following pessimistic argument about gun control:

***Example 2.8*** *Either we ban all handguns or homicide rates will remain high. We will not ban all handguns. We can conclude that homicide rates will remain high.*

In this case the speaker tells us which statement is the conclusion of the argument by using the phrase "We can conclude that." We call expressions that serve this purpose *conclusion indicators*. Numerous expressions can play this role, including the following:

CONCLUSION INDICATORS
- so
- thus
- therefore
- hence
- we can conclude that
- consequently

There are also expressions that help identify premises. Among the most common of these are:

PREMISE INDICATORS[1]
- since
- for
- because
- for the reason that

The statement that immediately follows a conclusion indicator is the conclusion; that following a premise indicator is a premise. This latter will seem natural when you consider that premises are reasons given in support of the conclusion, and all the premise indicators mean roughly "for the reason that."

1. These words are not always used as premise indicators. For example, *since* can also be used to indicate order in time, as in the statement, "Since (that is, *in the time since*) Joe went to medical school, he has established a practice in the field of AIDS treatment."

Additional indicators typically come between premises and conclusions:

| PREMISE AND CONCLUSION INDICATORS | | |
|---|---|---|
| (premise) | . . . shows that . . . | (conclusion) |
| " | . . . indicates that . . . | " |
| " | . . . proves that . . . | " |
| " | . . . entails that . . . | " |
| " | . . . implies that . . . | " |
| " | . . . establishes that . . . | " |
| " | . . . allows us to infer that . . . | " |
| " | . . . gives us reasons for believing that . . . | " |

Or, alternatively, they come between conclusions and premises:

| CONCLUSION AND PREMISE INDICATORS | | |
|---|---|---|
| (conclusion) | . . . is shown by . . . | (premise) |
| " | . . . is indicated by . . . | " |
| " | . . . is proven by . . . | " |
| " | . . . is entailed by . . . | " |
| " | . . . is implied by . . . | " |
| " | . . . is established by . . . | " |

## Marking the Parts of Arguments

The distinction between the premises and conclusion in an argument can be marked more formally in several ways. We can graphically set them apart by putting the argument into a *standard form*. To do this, we list the premises, numbering each separate statement. Then we draw a line to separate premises from the conclusion. The conclusion is below the line. Traditionally, conclusions have been marked by a sign consisting of three dots. The argument in Example 2.8 would be written in standard form as

***Example 2.8 in Standard Form***

*(1) Either we ban all handguns or homicide rates will remain high.*

*(2) We will not ban all handguns.*

---

*∴ Homicide rates will remain high.*

Note that we leave out premise and conclusion indicators, as well as words that connect the premises, such as *and* or *but*.[2] These words become unnecessary because our manner of displaying the argument already indicates which statements are premises, how many there are, and what is asserted as the conclusion.

For simple arguments written out in detail, a second, abbreviated version of the process of putting an argument in standard form involves circling the parts of a passage that contain premises and the conclusion and marking the premises with the symbols $Pr_1$, $Pr_2$, and so on, and the conclusion with *C*. Take a look at Example 2.9.

***Example 2.9***

*Since whales and dolphins are mammals* ($Pr_1$) *and mammals need to breath air,* ($Pr_2$)
*whales and dolphins need to breath air.* (*C*)

Notice that premises and the conclusion must be complete statements. In Example 2.10, the fragment "If smoking poses a risk to the health of bystanders" alone can't serve as a premise because it is not a complete statement. Notice as well that this argument contains three premises as well as the conclusion.

***Example 2.10***

$Pr_1$ *If smoking poses a risk to the health of bystanders, then it violates their rights.*
$Pr_2$ *If smoking violates the rights of bystanders, smoking in public ought to be restricted.*
$Pr_3$ *Smoking does pose a risk to the health of bystanders.*
*Therefore,*
*C* *smoking in public ought to be restricted.*

Theoretically, there is no limit to the number of premises an argument can contain. However, most arguments found in ordinary discourse contain only a few premises.

## Exercise 2.1 Techniques for Marking the Parts of Arguments

Try these techniques in the following exercises. Put exercises 1 and 2 into *standard form;* for exercises 3–16, *circle and label* the premises and conclusions.

2. If the word *and* occurs within a premise rather than between premises, it should not be omitted.

1. Any friend of mine deserves my respect. Ed is a friend of mine. Therefore, Ed deserves my respect.

*(In standard form:)*

*(1)*

*(2)* _____

∴

2. Abortion raises serious moral questions because abortion involves the taking of a human life, and anything that involves the taking of a human life raises serious moral questions.

*(In standard form:)*

*(1)*

*(2)* _____

∴

(*Circle and label* the premises and conclusion in the following exercises.)

3. If your mind were organized, your desk would be organized. Your desk isn't organized. It follows that your mind isn't organized.
4. If a child has formed a strong bond with the family that adopted her, then the biological parents should not reclaim her. Natalie has formed a strong bond with the family that adopted her. Hence, her biological parents should not reclaim her.
5. An activity pays if the people who engage in it come out ahead economically more often than not. The people who engage in many crimes come out ahead economically more often than not. It follows that many crimes pay.
6. The computer will alter society in many unpredictable ways for the reason that all major technological advances alter society in many unpredictable ways, and the computer is a major technological advance.
7. It is wrong for society to kill a murderer. This follows for the reason that if a murderer is wrong in killing his victim, then society is also wrong in killing the murderer. And a murderer is wrong in killing his victim.
8. All pornography should be banned. This allows us to infer that *National Geographic* magazine should be banned, because anything that contains pictures of naked adults and children is pornographic, and *National Geographic* contains pictures of naked adults and children.

9. If private enterprise does better than government at running businesses, then it will do better at running schools. Private enterprise does better at running businesses. We can conclude that private enterprise will do better at running schools.
10. Any area of study that contributes to the field of medicine should be well supported. Therefore, biology should be well supported, since it contributes to the field of medicine.
11. If privatizing schools would leave poorer, more-difficult-to-educate students at a disadvantage, then privatizing schools will only worsen the problems of inner cities. It follows that privatizing schools will worsen the problems of inner cities since privatizing would leave poorer, more-difficult-to-educate students at a disadvantage.
12. If you have an irresponsible mate, then either you should avoid having a child or you should prepare yourself for the difficulties of single parenting. Hence, you should avoid having a child since you do have an irresponsible mate, and you don't want to prepare yourself for the difficulties of single parenting.

It might seem more difficult to identify premises and conclusions in passages with long, complex sentences. Actually, the task remains fairly simple if you can locate the indicator words that divide an argument into its parts, as in the following exercises.

13. Capital punishment should be abolished. This is so because a nonwhite murderer whose victim is white is much more likely to be executed than a white murderer whose victim is either white or nonwhite. If that is the case, then either this kind of discrimination should be eliminated, or the death penalty should be abolished. Unfortunately, this kind of discrimination cannot be eliminated.
14. If capital punishment deters potential murderers, then if it is not inflicted, some innocent person will be murdered. It is better for a murderer to be executed than for an innocent person to be murdered. Thus, if capital punishment deters potential murderers, then it should be inflicted.
15. Since smoking is addictive, we can conclude that production of cigarettes should be more tightly restricted. This is because if smoking is addictive, then cigarette companies are trafficking in addictive substances; and if cigarette companies are trafficking in addictive substances, production of cigarettes should be more tightly restricted.
16. If Americans continue to reject candidates for public office who propose significant tax increases, then the needed improvements to our infrastructure, including our educational system, will be impossible. If the needed improvements to our infrastructure will be impossible, then we will be unable to

retain our economic competitiveness with Europe and Asia. Consequently we will be unable to retain our economic competitiveness with Europe and Asia, because Americans will continue to reject candidates for public office who propose significant tax increases.

## What to Do When There Are No Indicator Words: The Principle of Charitable Interpretation

Indicator words explicitly mark the intended role of statements in an argument. But authors often omit indicator words on the assumption that it is obvious which of their statements are offered as support and which statement is being supported. When there are no indicator words, and it is questionable what an argument's premises or conclusion are, you should employ what might be called the *Principle of Charitable Interpretation:*

> **Principle of Charitable Interpretation:** When more than one interpretation of an argument is possible, the argument should be interpreted so that the premises provide the strongest support for the conclusion.

This principle is in keeping with the rationale for critical reasoning offered in chapter 1. The object is not to make your opponent's argument look as weak as possible but to decide what is most reasonable to believe. It is to this end that arguments under consideration should be given the strongest possible interpretation.

One procedure for identifying the premises and conclusion that this principle suggests involves trying each statement of an argument in the role of conclusion, with the remaining statements acting as premises. Whichever statement is best supported by the others should be taken to be the conclusion. Note the following argument:

***Example 2.11***

*You should have come to the meeting. You promised Alicia you would come. If you promise to do something, you should do it.*

It can be seen fairly readily that the first statement is better supported by the remainder of the argument than either of the other two. If we put the argument into standard form, alternating each statement in the role of conclusion, we can see more easily that this reading is the best. Although this lengthy process is seldom necessary in actually interpreting an argument, it might be helpful in this case to go through it to show how the plausibility of the different alternatives varies.

Putting the argument into standard form with the first sentence as the conclusion gives us

***Reading 1***

*(1) If you promise to do something, you should do it.*

*(2) You promised Alicia you would come.*

---

*∴ You should have come to the meeting.*

This interpretation of the passage is best because if the premises are true, the conclusion must also be true. And, as will be explained in succeeding chapters, this is precisely the relationship of support between premises and conclusion that is one requirement for a good deductive argument. By considering what each statement means, you can see that the premises adequately support the conclusion. The first premise states that if you satisfy a certain condition (making a promise), then you have an obligation (keeping the promise). The second premise adds that you did satisfy the condition of promising something (that is, to come to the meeting). If these premises are true, then the conclusion—*you should have come to the meeting*—must be true.

In contrast, the supposed premises in the other readings do not adequately support their supposed conclusions. The premises could be true without the conclusion being true.

***Reading 2***

*(1) You should have come to the meeting.*

*(2) You promised Alicia you would come.*

---

*∴ If you promise to do something, you should do it.*

It could be true that you should have come to the meeting, and that you promised Alicia, but these facts do nothing to support the more general conclusion that if you promise to do something, you should do it.

***Reading 3***

*(1) You should have come to the meeting.*

*(2) If you promise to do something, you should do it.*

---

*∴ You promised Alicia you would come.*

The claims that you should have come, and that if you promise something, you should do it, do not support the claim that you promised Alicia you would come. It could be that you should have come (you would have had the chance to meet some interesting people), and that you should keep your promises; but it could at the same time be false that you promised Alicia you would come.

Again, in actual practice, the context in which you find a passage limits the number of possible interpretations that can reasonably be made. The formulation of the Principle of Charitable Interpretation given here should be taken as preliminary and subject to this qualification.

## Exercise 2.2 Using the Principle of Charitable Interpretation to Pick Out Premises and Conclusions in Arguments Without Explicit Indicator Words

Identify the premises and the conclusion in each of the following arguments. Interpret each argument so that the premises give the best support for the conclusion. As we have indicated, arguments do not ordinarily occur in such simplified form, with every statement in a passage serving as either a premise or a conclusion. We are presenting these stylized passages to sharpen your skills at identifying argument parts.

1. If you buy a fur coat, then you are supporting the fur industry. If you are supporting the fur industry, then you are encouraging cruel treatment of animals. If you buy a fur coat, you are encouraging cruel treatment of animals.
2. Either the government should protect children from abuse and neglect by their parents, or it should reinstitute orphanages. The government will not protect children from abuse and neglect by their parents. The government should reinstitute orphanages.
3. Every person should avoid keeping loaded guns around the house. All those who have the capacity to kill should avoid keeping loaded guns around the house. Every person has the capacity to kill.
4. You will dread growing older. If you take too much pride in your physical appearance, you will dread growing older. You take too much pride in your physical appearance.
5. Anyone who is overly ambitious will alienate her friends. Sheila is overly ambitious. Sheila will alienate her friends.
6. If you respected my opinion, you would seek my advice. You don't seek my advice. You don't respect my opinion.
7. Either the United States will tackle the real social ills that beset its cities or it will lose the "war on drugs." The United States will not tackle the real social ills that beset its cities. The United States will lose the "war on drugs."
8. All restrictions on smoking are restrictions on personal freedom. All restrictions on personal freedom are in need of strong justification. All restrictions on smoking are in need of strong justification.

9. Any gun law gives advantage to lawbreakers. Anything that gives an advantage to lawbreakers makes law-abiders less safe. Any gun law makes law-abiders less safe.
10. The ban on selling hypodermic needles should be lifted. If we want to combat AIDS, then we must prevent drug users from sharing dirty needles. If we must prevent the sharing of dirty needles, then the ban on selling needles should be lifted. And obviously, we do want to combat AIDS.
11. If capital punishment deterred murder better than life imprisonment, then states with capital punishment would have lower murder rates than comparable states with life imprisonment only. States with capital punishment do not have lower murder rates than comparable states with life imprisonment only. Capital punishment does not deter murder better than life imprisonment.
12. Couples should be discouraged from marrying young. Marriage takes a great adjustment. If it takes a great adjustment and the young find such adjustment difficult, they should be discouraged from marrying. The young find adjustment to the demands of marriage difficult.

## Patterns of Argument

The Principle of Charitable Interpretation asks us to interpret an argument so that the statements we take as premises best support the statement we take as the conclusion.[3] We have assumed that you are already able to see, in the simplest cases, which statement is best supported by the remaining statements. But to become clearer about this relationship of support, consider two ways of interpreting the following argument:

***Argument*** *If my car is out of fuel, it won't start. My car won't start. My car is out of fuel.*

***Interpretation 1***

*(1) If my car is out of fuel, it won't start.*

*(2) My car is out of fuel.*

---

*∴ My car won't start.*

3. Again, when you apply this principle, you are limited by what can plausibly be interpreted as the intent of the passage.

***Interpretation 2***

*(1) If my car is out of fuel, it won't start.*

*(2) My car won't start.*

*∴ My car is out of fuel.*

In interpretation 2, the conclusion does not follow from the premises. There are other reasons a car might not start than that it is out of fuel; perhaps the ignition system has failed. Even if the first premise is true and the car does not start, it doesn't follow that it is without fuel. Now contrast this to interpretation 1. If it is true that the absence of fuel prevents starting, then it is unavoidable that if you are out of fuel, the car will not start. We can't find a situation for interpretation 1 (like the ignition problem for interpretation 2) that would make the premises true but the conclusion false.

You could try to reason through to the best interpretation in this way each time you encounter a passage without indicator words and are unsure of what to pick as premises and what as the conclusion. But it is helpful to note that the two interpretations that were just considered are instances of argument patterns that you will encounter again and again; every time you see an instance of the pattern in interpretation 1, the conclusion does follow from the premises, whereas for the pattern in interpretation 2, the conclusion doesn't follow.

A pattern involves the repetition of elements. In interpretation 1, the two statements are repeated: *My car is out of fuel* and *It (my car) won't start*. It is customary to represent these elements by letters.[4] The pattern in interpretation 1 might be represented as:

*(1) If A, then B.*

*(2) A.*

*∴ B.*

*MODUS PONENS or*
*AFFIRMING THE ANTECEDENT*

This pattern is so common that it has been given a name: *modus ponens*.[5] The faulty pattern in interpretation 2 might be represented as:

---

4. In the example we use the letters *A* and *B*, but you could use other letters—for example, *F*—to remind us of the statement involving *Fuel* and *S* to remind us of a statement containing *Start*.

5. Notice that what remains after the repeated elements are marked by the letters *A* and *B* is the expression "if . . . then." This expression along with "or" and "and" are called *logical connectives*—they connect two statements. Special symbols are sometimes used to represent them: the arrow, →, for "if . . . then"; the ampersand, &, for ". . . and . . ."; the *vel*, ∨, for "or." This way of showing form is discussed at greater length in chapter 5, which covers a more formal approach to deductive arguments. We could represent *modus ponens* as:

*(1) A → B.*

*(2) A.*

*∴ B.*

*(1) If A, then B.*

*(2) B.*

*∴ A.*

*AFFIRMING THE CONSEQUENT*
*(Faulty)*

Even though this is a faulty pattern, it is common enough that it also has acquired a name. It is known as the *fallacy of affirming the consequent* (because the second premise *affirms* the "then . . ." part,—that is, the *consequent* of the first premise).

The point of the foregoing discussion is that if a passage could be fit into either of the two patterns, the Principle of Charitable Interpretation would dictate fitting into the *modus ponens* pattern, because with this interpretation the premises provide the best support for the conclusion.

A related but different pair of interpretations can be given for the argument: If you respected my opinion, you would seek my advice. You don't seek my advice. You don't respect my opinion. Here are two ways of identifying the premises and conclusion:

***Interpretation 1***

*(1) If you respected my opinion, you would seek my advice.*

*(2) You don't seek my advice.*

*∴ You don't respect my opinion.*

***Interpretation 2***

*(1) If you respected my opinion, you would seek my advice.*

*(2) You don't respect my opinion.*

*∴ You don't seek my advice.*

In interpretation 1, the conclusion does follow from the premises. The first premise states that *if you respected my opinion, then you would seek my advice*. Suppose the second premise states that *you don't seek my advice*. Now in order to make both these premises true, we are compelled to say that you don't respect my opinion. If we tried to claim both that the first premise is true and that you do respect my opinion, then we would be forced to say that you would seek my advice. But this would make the second premise false. In other words, the only possible way to make both premises true is to make the conclusion true also. This pattern of argument is called *modus tollens* and is represented as:[6]

6. In addition to the symbols →, &, and ∨ for "if . . . then," "and," and "or," the symbol ¬ or just a dash, – , is often used for "It is not the case that . . . ." Unlike the first three symbols, which come between two statements, ¬ stands in front of a single sentence. Using this symbol, we can represent *modus tollens* in this way: *(1) A → B.*
*(2) ¬ B.*
*∴ ¬ A.*

*(1) If A, then B.*

*(2) Not B.*

*∴ Not A.*

*MODUS TOLLENS or DENYING THE CONSEQUENT*

In interpretation 2, the conclusion *doesn't follow from the premises*. It very well could be that if you did respect my opinion, you would seek my advice. (Suppose you need information badly and will go to any source you consider reliable.) It also could be that you don't respect my opinion; maybe you have heard that I have been mistaken more times than not. But it doesn't follow that you won't seek my advice. You might do so just to flatter me and keep me as a friend. That is, there might be more than one reason for a given consequent. It is perfectly possible for the premises of this argument to be true without the conclusion being true.

Arguments of this pattern are often persuasive, even though they shouldn't be. The pattern, called *denying the antecedent*, looks like this:

*(1) If A, then B.*

*(2) Not A.*

*∴ Not B.*

*DENYING THE ANTECEDENT (Faulty)*

Although there are numerous argument patterns besides *modus ponens* and *modus tollens* whose premises guarantee the truth of their conclusions, there are a few that occur so frequently that they are worth learning at the outset. The following chart displays seven common argument patterns, including *modus ponens* and *modus tollens*. Any argument that fits one of these patterns will satisfy the criterion that if the premises are true, the conclusion must be true. Therefore, any plausible reading of a passage that fits one of these patterns would be supported by the Principle of Charitable Interpretation.

**Some Common Successful Argument Patterns**

**Statement-Based Patterns**

| Argument Pattern | Examples |
|---|---|
| **i. Modus Ponens** | |
| *(1) If A, then B.* | *(1) If I lie, then I'll be sorry.* |
| *(2) A.* | *(2) I'll lie.* |
| *∴ B.* | *∴ I'll be sorry.* |
| **ii. Disjunctive Argument** | |
| *(1) Either A or B.* | *(1) Either I should jog or I should diet.* |
| *(2) Not A.* | *(2) I should not jog.* |
| *∴ B.* | *∴ I should diet.* |

**iii. Modus Tollens**

| | |
|---|---|
| *(1) If A, then B.* | *(1) If you study, then you learn.* |
| *(2) Not B.* | *(2) You didn't learn.* |
| *∴ Not A.* | *∴ You didn't study.* |

**iv. Hypothetical Argument**

| | |
|---|---|
| *(1) If A, then B.* | *(1) If I pay now, then I'll save.* |
| *(2) If B, then C.* | *(2) If I'll save, then I'll have money later.* |
| *∴ If A, then C.* | *∴ If I pay now, then I'll have money later.* |

**v. Chain Argument**

| | |
|---|---|
| *(1) A.* | *(1) The whole group is coming.* |
| *(2) If A, then B.* | *(2) If the whole group is coming, then we'll need more refreshments.* |
| *(3) If B, then C.* | *(3) If we'll need more refreshments, then we'll have to go to the store again.* |
| *∴ C.* | *∴ We'll have to go to the store again.* |

**Predicate-Based Patterns**

**vi. Predicate Instantiation**

| | |
|---|---|
| *(1) All $P_1$'s are $P_2$'s.* | *(1) All good teachers are sensitive to the needs of students.* |
| *(2) m is a $P_1$.* | *(2) Jones is a good teacher.* |
| *∴ m is a $P_2$.* | *∴ Jones is sensitive to the needs of students.* |

**vii. Universal Syllogism**

| | |
|---|---|
| *(1) All $P_1$'s are $P_2$'s.* | *(1) All good teachers treat students with respect.* |
| *(2) All $P_2$'s are $P_3$'s.* | *(2) All who treat students with respect listen to students.* |
| *∴ All $P_1$'s are $P_3$'s.* | *∴ All good teachers listen to students.* |

The capital letters *A*, *B*, and *C* in patterns i-v stand for whole *statements;* we call this type of argument pattern *statement-based*. In patterns vi and vii, the terms $P_1$, $P_2$, and $P_3$ stand for parts of statements, such as "good teacher," which refer to classes of objects. The lowercase letter *m* in pattern vi stands for a name or description of a

particular person or thing. These names or descriptions can be seen as subjects that fit with a *predicate* such as "is a good teacher" to form a whole statement: "Jones is a good teacher." We will call the argument patterns vi and vii *predicate-based*. This chart provides only a sample of commonly found successful patterns. We discuss what makes them "successful" and how to determine whether a prospective pattern represents a *valid deductive* argument form in chapter 4.

By becoming familiar with these patterns, you will get a feel for the kind of relationship between premises and conclusions you are looking for when you apply the Principle of Charitable Interpretation. Chapters 4 and 5 discuss argument patterns in greater detail, explaining some of the ways to determine whether an argument pattern is successful.

## Exercise 2.3 Using Argument Patterns to Pick Out Premises and Conclusions in Arguments Without Explicit Indicator Words

Each of the exercises in this section fits one of the patterns identified on the preceding pages or a combination of them. Several tips will help you to identify these patterns in written arguments. First, the order of the premises makes no difference:

*(1) If B, then C.*

*(2) A.*

*(3) If A, then B.*

*∴ C.*

exhibits the same pattern for our purposes as

*(1) A.*

*(2) If A, then B.*

*(3) If B, then C.*

*∴ C.*

Second, in an either-or type sentence, order does not make any difference (though it does in an if-then type sentence):

*(1) Either B or A.*

*(2) Not A.*

*∴ B.*

exhibits the same pattern as

*(1) Either A or B.*

*(2) Not A.*

*∴ B.*

Third, arguments can fit these patterns even if some key words are missing. For example, if-then sentences often occur without the *then,* as in: "If you lend me ten dollars, I'll love you forever." They may even have the *if* part at the end of the sentence, as in: "I'll bring the food, if you'll bring the wine." Either-or type sentences may occur without the *either* stated: "I'll have coffee or tea." And the word *all* may be replaced by other expressions such as *every* or *any,* as in: "Every person needs a friend."

In the process of identifying premises and a conclusion, other features of a passage may provide further clues. First, since the conclusion is often the main point in an argumentative passage, look carefully at readings that treat the beginning or the final sentences as the conclusion. Second, the conclusion of an argument is seldom longer and more complex than the premises. For example, we should be suspicious of a reading in which the conclusion is an if-then sentence but the premises are not.

As we have indicated, arguments do not ordinarily occur in such simplified form. We are presenting these "unnatural" passages to sharpen your skill at identifying premises, conclusions, and argument patterns.

1. Go back to Exercise 2.2 and use the argument patterns to identify premises and conclusions. Note any arguments you interpreted incorrectly before you learned the argument patterns.
2. Identify the premises and conclusion, as well as the argument pattern, for each of the following exercises:
   a. John is bound to sharpen his argumentative skills. He is studying critical reasoning, and anyone who studies critical reasoning is bound to sharpen his argumentative skills.
   b. If your relationship with your spouse were based on fair exchanges, then it would be stable. It is not stable. Your relationship with your spouse is not based on fair exchanges.
   c. If Paul can find the strength to resist Sheila's advances, then he will be able to salvage some measure of self-respect. He will find this strength. He will salvage some self-respect.
   d. Anyone who deceives other people is guilty of a form of coercion. Anyone who deceives others is manipulating their choices. Anyone who manipulates the choices of others is guilty of a form of coercion.

e. Your car doesn't have fuel. If it had fuel, it would have kept running. It didn't keep running.
f. Alvin has not fulfilled the graduation requirements. If he has fulfilled the graduation requirements, then he is eligible for graduation. Alvin is not eligible for graduation.
g. Any armed intervention should be entered only as a last resort. Any armed intervention has many innocent victims. Any activity that has many innocent victims should be entered only as a last resort.
h. Students will not become more interested in learning for its own sake. Universities will become more vocationally oriented. Either students will become more interested in learning for its own sake or universities will become more vocationally oriented.
i. If a human being is created at the moment of conception, then abortion always kills a human being. If abortion always kills a human being, then it is never justified. If a human being is created at the moment of conception, then abortion is never justified.
j. Casual sex is justifiable in some cases. If some people can't find a partner who is willing to enter a serious relationship, casual sex is their only alternative to abstinence. Some people can't find a partner who is willing to enter a serious relationship. If casual sex is the only alternative to abstinence for some people, then casual sex is justifiable in some cases.
k. Roberta will eventually become desensitized to violence. Everyone who watches a lot of violent films eventually becomes desensitized to violence. Roberta watches a lot of violent films.

3. The following arguments don't exactly fit any of the seven patterns listed on the chart in this chapter. Try to determine their patterns. Identify the premises and conclusion and formulate the (new) patterns.

a. True conservatives resist spending for social programs. Our senator doesn't resist spending for social programs. Our senator is not a true conservative.
b. We shouldn't abolish capital punishment. If we do, prisons will become more crowded. If prisons become more crowded, then we will have to build more prisons. We don't want to build more prisons.
c. Some judges have been subjected to corrupting influences. Anyone who has practiced law has been subjected to corrupting influences. Some judges have practiced law.
d. If we limit welfare to a few years, then we must either guarantee health care to everyone, or we must be willing to let those taken off welfare go without health care. We have limited welfare to a few years. We are not willing to let those taken off welfare go without health care. We must guarantee health care to everyone.

e. Either you should take control of your own life or trust the advice of a mentor. If you trust the advice of a mentor, then you stand the risk of being used to fulfill the mentor's own dreams. You should not take that risk. You should take control of your own life.

## Identifying Premises and Conclusions in Longer Passages

So far, we have presented short passages consisting entirely of premises and conclusions. In such cases, the task of identifying these argument parts is simplified—we know that one of the statements is the conclusion and the remaining ones are premises. If we don't see immediately which statement is the conclusion, we can go through a process of elimination trying each statement in that role and asking how well the remaining statements serve as support.

In longer passages, identifying premises and conclusions is more difficult and more a matter of interpretation. Even if the main purpose of a passage is to present an argument, most of the statements in it usually are neither premises nor conclusions. The passage displayed on page 40 is an adaptation of the editorial given in the exercise at the end of chapter 1. It contains several paragraphs from the original with the addition of several sentences that make the argument in the passage more explicit. Although it is still somewhat more complete than many argumentative passages found in actual editorials, it is quite typical in including a variety of statements that illustrate points, make reference to supporting sources, or restate elements in the argument.

The unshaded statements from the passage constitute an argument. The conclusion is marked by a *C* in the margin and contains the conclusion indicator word *therefore*. The statements marked $P_1$, $P_2$, and $P_3$ are premises that support this conclusion.

In this case, the premises and conclusion fit together into one of the patterns on our chart of Some Common Successful Argument Patterns:[7]

***Example 2.12***

*(1) A.*

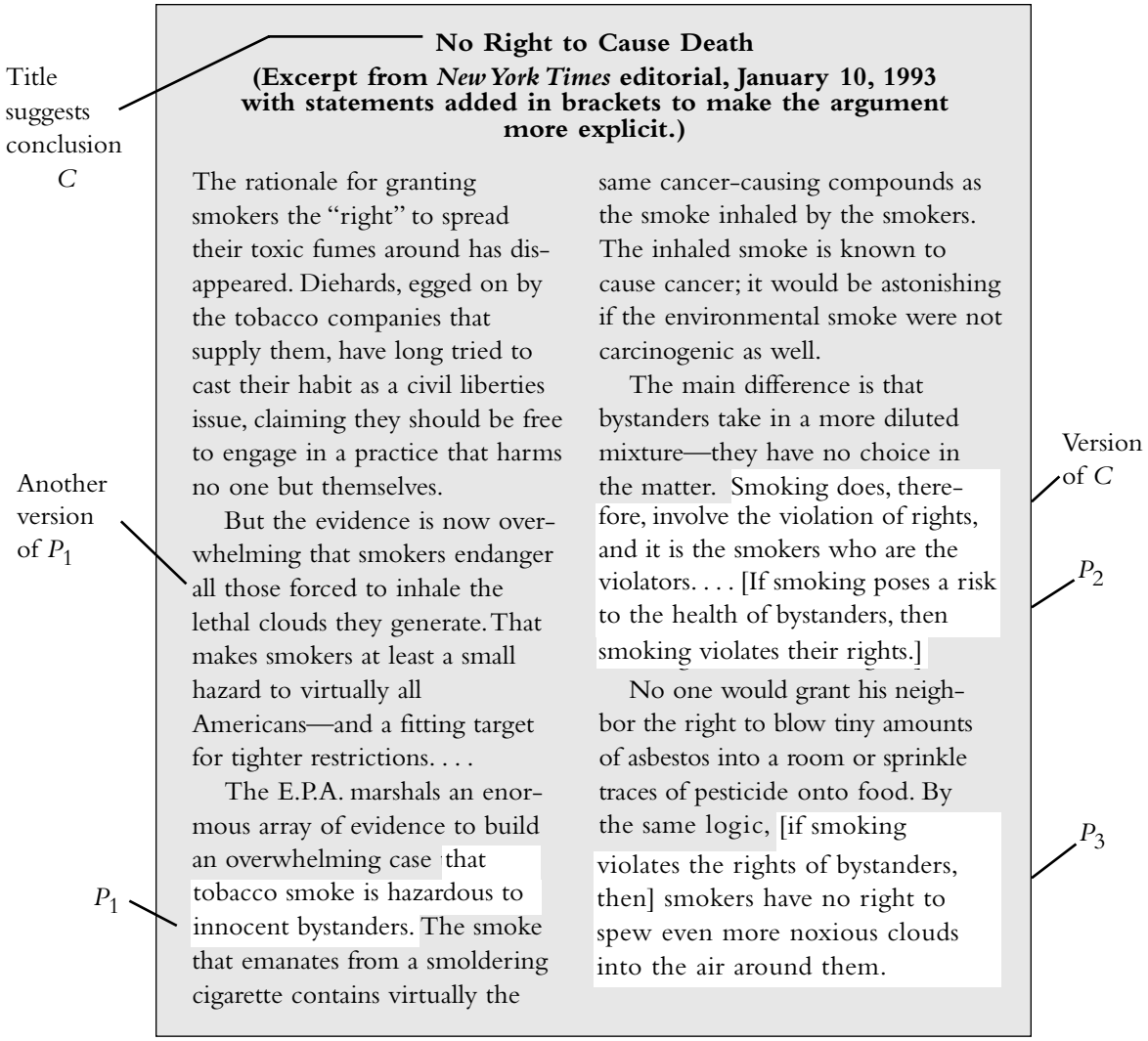
*(2) If A, then B.*

*(3) If B, then C.*

∴ *C.*

This argument form corresponds to the rough interpretation on page 41:

7. Note that this argument pattern, which we have called the *chain argument*, is fifth on the chart and can be seen as a combination of the first, *modus ponens*, and the fourth, *hypothetical syllogism*.




**No Right to Cause Death**

**(Excerpt from *New York Times* editorial, January 10, 1993 with statements added in bracketed to make the argument more explicit.)**

The rationale for granting smokers the "right" to spread their toxic fumes around has disappeared. Diehards, egged on by the tobacco companies that supply them, have long tried to cast their habit as a civil liberties issue, claiming they should be free to engage in a practice that harms no one but themselves.

But the evidence is now overwhelming that smokers endanger all those forced to inhale the lethal clouds they generate. That makes smokers at least a small hazard to virtually all Americans—and a fitting target for tighter restrictions. . . .

The E.P.A. marshals an enormous array of evidence to build an overwhelming case that tobacco smoke is hazardous to innocent bystanders. The smoke that emanates from a smoldering cigarette contains virtually the same cancer-causing compounds as the smoke inhaled by the smokers. The inhaled smoke is known to cause cancer; it would be astonishing if the environmental smoke were not carcinogenic as well.

The main difference is that bystanders take in a more diluted mixture—they have no choice in the matter. Smoking does, therefore, involve the violation of rights, and it is the smokers who are the violators. . . . [If smoking poses a risk to the health of bystanders, then smoking violates their rights.]

No one would grant his neighbor the right to blow tiny amounts of asbestos into a room or sprinkle traces of pesticide onto food. By the same logic, [if smoking violates the rights of bystanders, then] smokers have no right to spew even more noxious clouds into the air around them.

***Rough Interpretation***

*(1) Tobacco smoke is hazardous to innocent bystanders.*

*(2) If smoking poses a risk to the health of bystanders, then smoking violates their rights.*

*(3) If smoking violates the rights of bystanders, then smokers have no right to spew even more noxious clouds into the air around them.*

---

*∴ Smokers have no right to cause death (that is, spew even more noxious clouds into the air around them).*

This interpretation of the argument is supported by other elements in the passage. As is indicated in the notes in the boxes on the left, the conclusion of the argument is suggested by the title, and another phrasing of premise 1 is given in the second paragraph. To put the argument into standard form in such a way that we follow the argument pattern given in Example 2.12 precisely, we need only paraphrase and slightly recast the rough interpretation.

***More Formal Interpretation***

*(1) Smoking poses a risk to the health of innocent bystanders.*

*(2) If smoking poses a risk to the health of innocent bystanders, then smoking violates the rights of innocent bystanders.*

*(3) If smoking violates the rights of innocent bystanders, then smokers have no right to smoke around other people.*

---

*∴ Smokers have no right to smoke around other people.*

The material in succeeding chapters will help you in interpreting longer passages. Use of indicator words as well as recognition of argument patterns will help you in carrying out this task. Passages found in editorials and other "real-world" contexts contain a variety of statements that are not essential (strictly speaking) to the presentation of an argument. They contain illustrations and references to sources as well as repetitions. Furthermore, as we will discuss in the next chapter, most of these passages do not explicitly contain all the elements needed to reconstruct an argument in standard form. The task of reconstruction is not purely "mechanical." You have to be prepared to discard many (in some cases most) of the statements in a passage to tease out an argument.

## Exercise 2.4 Reconstructing Explicit Arguments in Longer Passages

Restate in standard form what you take to be the main argument put forth in the following passages. If you can, make the argument fit a pattern so that the conclusion follows from the premises. This may involve putting the premises and

conclusion into your own words. You may need to rewrite your interpretation several times before it will fit into a concise pattern. (After you have worked on this individually, you might want to work with a group of other students, combining some of your insights to produce a better interpretation.)

1.

**Guns and Free Discourse**

The Second Amendment guarantee to bear arms is no less clear than the First Amendment guarantee of free expression. Gun control advocates overlook this similarity. Often the same person supports gun control but opposes censorship of controversial "art." But either gun control is unconstitutional or artistic expression is not constitutionally guaranteed.

The courts have consistently ruled that the Constitution assures adults freedom of expression. Even though some might be offended, it is not enough that people find a work distasteful. Our Constitution guarantees the right to produce and view it. So, even though contemporary society suffers from too many guns, gun possession is similarly assured by our Constitution.

2.

**Networks Don't Get Connection**
**(Excerpt from column by Cal Thomas**
***Seattle Post-Intelligencer,* May 14, 1992)[8]**

ABC Television broadcast a special "Men, Sex and Rape,". . . full of "pretension to virtue." . . . First Amendment absolutists have resisted every attempt to control the huge levels of effluent [from TV] that have turned our society into a toxic waste dump. . . . One does not have to be a social scientist to see a connection between increased incidents of rape, and other acts of violence against women, and the way women are treated in the popular media. . . . If rape is a terrible crime, and it is, and if there is a connection between pornography and the cultural permission it gives those already predisposed to perform these acts on women, then the government has an obligation and duty to control its proliferation.

8. The full, unmodified version of the editorial is given as an exercise at the end of chapter 4.

3.

**Gender Tests May Not Be Worth Risk of Misuse**
**(Excerpt from column by Ellen Goodman, with statements added in brackets for clarification in this exercise)[9]**

The woman beside me pats her rounded stomach and rolls her eyes to the ceiling, exclaiming, "Is she ever active today!" The "she" in this action won't be born until March. But my pregnant companion already knows the gender of this gestation.

I have grown accustomed to the attachment of a pronoun to a fetus by now. Most women I know of her age and anxiety level have had "the test" and gotten the results.

Over the past two decades, through amniocentesis and then CVS and sonograms, a generation of parents has received a prenatal exam, a genetic checkup on their offspring. They have all been given new information and sometimes new, unhappy choices. . . .

But this test may increase the possibility of abortion for sex selection by those who regard gender—the wrong gender—as a genetic flaw. . . .

It is the rare person who defends it on the grounds of population control or pure parental choice. It is a rarer American who chooses it. Indeed, the only countries in which sex selection occurs in discernible numbers have been those such as India or Korea where daughters have long been unwanted. It is almost always female fetuses that are aborted.

But gender testing and the capacity for gender choosing—before and after conception—is an ethical issue in this country, too. This is the first, but hardly the last time, that the new technology will be available to produce designer babies. Today, genetic testing is valued in America because it leads to the diagnosis of diseases that cause pain and death and disability. Eventually it may lead to their cure. But in the future, we also are likely to have access to much more information about genes than we need medically. We may be able to identify the gene for height, hair color, eye color, perhaps even athletic ability or intelligence. [America's fascination with technology suggests that we will not be able to resist the temptation to use this technology for sex selection.

If gender testing and gender choosing are permitted to become widely and easily available, then we must be able to resist using it.] At the moment, the moral consensus against sex selection is holding. . . . But in the longer run, the rest of us may be called upon to ask whether our curiosity about gender is worth the risk that others will misuse that information. [Consequently, programs of gender testing and choosing should not be permitted to become more broadly accessible.] It may be wiser to learn if the baby is a "he" or a "she" the old-fashioned way.

9. The full editorial is presented as an exercise in chapter 10.

## Applications to Writing

In this and many of the succeeding chapters we discuss how to put critical techniques into practice. It is difficult to discuss a particular aspect of criticism without presupposing a broader range of critical skills. The situation is similar to that of learning a sport like tennis. The tennis instructor must start with some particular aspect of the swing, leaving the others in rough form. Then the remaining aspects of the swing are developed one by one and fitted into the whole. Similarly, many of our exercises and examples presuppose some understanding of a range of skills that may not have been explicitly discussed in the text at that stage. We hope that you will be able to sharpen the particular skill that is the subject matter of each chapter, while at the same time seeing how this skill fits into the broader context of critical reasoning. We begin by discussing how identifying premises and conclusions can be helpful in presenting arguments in written essays. This is just a short first step.

When you present an argument in writing, it is important to convey to the reader what position you are supporting and what reasons you are offering in support. This might seem so obvious as to not be worth mentioning, but an essay that is hastily written or not well thought out often presents a series of loosely related statements with no hint of what is to be taken as premises or as the conclusion. The reader is left in the position of considering each assertion, agreeing with some, disagreeing with others, but being led nowhere. This sort of reading experience is neither enjoyable nor edifying. Consider this example:

***Example 2.13***

*In the United States there is supposedly freedom of expression, and yet there are laws against obscenity. No one can say what obscenity really is. And is obscene material really harmful? Psychologists are not at all certain that it is. Some forms of censorship are probably necessary. But we shouldn't keep saying we have a free country when we really don't.*

As a first step in editing such a passage, it is useful to mark the main points or conclusions it contains. Some of the statements can be taken to support the view that the United States is not truly free. Other statements seem to support the position that there should not be laws against obscenity. But neither of these points is used to support the other, and it is questionable whether they belong in the same paragraph. If the writer of this passage had considered which statement she intended as her conclusion, she would have focused the paragraph on one or the other of these points. Editing and rewriting might then have produced either of the following:

***Rewrite 1***

*We should admit that freedom of expression is not truly realized in the United States, since any censoring of materials constitutes a definite limitation of this freedom.*

***Rewrite 2*** *If a law is so vague that it is difficult to know what counts as a violation of it, and if there is really no harm that this law prevents, then the law should be abolished. Laws that prohibit obscenity have both of these defects. The conclusion to which we are driven is obvious.*

When you rewrite a loosely organized passage, do not be afraid to delete substantial portions to give the passage focus. If the deleted points are worth making, they can be made in another part of your essay.

We are not claiming that a polished paragraph of prose consists of nothing but premises and a conclusion. Indeed, neither Rewrite 1 nor Rewrite 2 would qualify as a polished paragraph—they are both far too spare. What should be added to fill them out are not the extraneous points from Example 2.13. Rather, each would benefit from an introductory sentence and from examples illustrating the points made by the premises, as well as explanations of important concepts that might not be clear to the reader.

The move from Example 2.13 to Rewrite 1 or Rewrite 2 might be seen as an intermediate step between an initial draft and a more polished piece of writing. An initial, exploratory draft is often done best in a spontaneous, unstructured way in order to get some ideas on paper. The advice we are giving here and in later chapters concerning writing deals primarily with editing and rewriting such a first draft, attending particularly to structure and logical flow. Additional steps of editing will be touched on only occasionally.

## Exercise 2.5 Making Premises and Conclusions Clear in Your Writing

Edit the following passages, making the premises and conclusion clear. Don't be afraid to eliminate some sentences or to change the wording of the remaining sentences. There is no single "correct" way of rewriting any of these, but some ways of rewriting will be better than others. One point that is helpful to keep in mind is that an argument should proceed from premises the reader is already inclined to believe to a conclusion she is less inclined to believe. Using a premise that is at least as doubtful as the conclusion it supports is not effective. And it is not interesting to be led to a conclusion that was obvious from the beginning. For *one* of the following exercises, write a complete, polished paragraph. It should contain not only premises and a conclusion but also an introductory sentence, examples to reinforce points made, and explanations of important concepts.

1. Regardless of whether your religious beliefs are true or false, you need some beliefs to hang onto. The universe couldn't have just started itself—it had to come from something. If we didn't have a God to believe in, our lives would have no meaning and we would have no hope. How can people rationally deny the existence of God?

2. People who favor capital punishment are mainly just looking for a way to satisfy their blood lust and get revenge. Capital punishment doesn't accomplish any constructive purpose, and it probably just makes society more violent to see killing condoned by the state. It is appalling that so many Americans favor this practice.
3. The United States should provide clear constitutional guarantees assuring completely equal rights for women. In the meantime it had better not allow women to face any possibility of combat. When you bring women into the armed forces you have all kinds of problems with harassment and sexist abuse that women receive in training and on duty. Even if women are given equal rights, such harassment in training will still be a problem. Perhaps women should have equal rights only in some areas. Some propositions can be pushed too far.
4. The decline in the number of lasting marriages poses a serious threat to the stability of American society. More and more children have to cope with the separation of their parents. Divorce reinforces the attitude that it is legitimate to break a commitment any time it becomes burdensome. Couples should consider these facts before they get married. If they aren't willing to enter the relationship seriously, it might be better for them just to live together.
5. The United States needs to formulate a coherent policy to spread the benefits of the new information economy to all segments of society. We are simply sitting back and letting market force create a two-tiered society—the rich, technology savvy and the poor, technology limited. If we continue to do so, we will create great social unrest. We have already seen a vast increase in wealth for the top 20 percent of the population with relatively modest gains for the rest. These differences cannot continue permanently. The compensation of the technological elite as well as the elite in athletics and even the arts is way out of line with other developed countries. We cannot afford to pay superstars, whether in high tech jobs or in sports, so much. This is not so much a problem in good economic times, but if the economy falters, resentment will build up.

CHAPTER THREE

# *Understanding Arguments Through Reconstruction*

Many of the examples considered in chapter 2 sound contrived because we don't usually hear or read arguments spelled out in such painful detail. Ordinary communication often assumes that the audience will be able to fill in the missing details. If you were discussing gender discrimination with a friend, for example, he might argue this:

***Example 3.1***

*I don't care what you say; if it's wrong to discriminate against a woman on the basis of her gender, then it is equally wrong to discriminate against a man on the basis of his.*

In this passage, there is no explicit conclusion, and a premise needed to complete the argument is missing.[1] In everyday discourse, arguments are often presented with implicit (that is, unstated) premises, and even implicit conclusions. In this chapter, we explain how the argument fragments that we commonly hear and read can be reconstructed so that their entire content, including implicit premises or conclusions, is explicitly displayed. In many situations such a full reconstruction is unnecessary. However, when you encounter complicated passages or seek to criticize an argument, it is often helpful to create such reconstructions. Once you have worked through some reconstruction exercises, you should find it easier to recognize what has been left implicit in fragmentary arguments, like the

1. The argument omits the premise that it is wrong to discriminate against a woman on the basis of her gender and the conclusion that it is wrong to discriminate against a man on the basis of his gender.

one stated in Example 3.1, even when you do not actually restate or rewrite the argument in reconstructed form. You are then in a better position to evaluate the assumptions or presuppositions behind the argument.

## Understanding Arguments by Identifying Implicit Conclusions

The least complicated case of reconstruction is one in which premises are supplied, with the audience left to "draw its own conclusion." In such circumstances the person offering an argument expects the context to make the conclusion clear. Suppose we hear a disc jockey giving this radio spot:

***Example 3.2***

*The smoother the sound, the better the station. The music is smoother at WARM radio.*

The obvious conclusion is that station WARM is better. In many cases like this, where only the conclusion is missing, the argument seems to point directly to the implicit conclusion.

Unfortunately, it isn't always so simple. Sometimes you might be in doubt about whether the conclusion of an argument is actually missing. In such a circumstance the technique of considering alternative readings, which was discussed in chapter 2, might help. Consider the following example:

***Example 3.3***

*If most American voters recognize that the cost of medical care is out of control, then the government will act. But everyone who has elderly relatives recognizes that the cost of medical care is out of control. And most American voters have elderly relatives.*

This passage has something to do with government response to rising medical costs. The passage does not, however, give many hints about its conclusion. We might begin by treating each of the three statements as the conclusion of the argument.

***Reading 1***

*(1) If most American voters recognize that the cost of medical care is out of control, then the government will act.*

*(2) Everyone who has elderly relatives recognizes that the cost of medical care is out of control.*

---

*∴ Most American voters have elderly relatives.*

***Reading 2***

*(1) If most American voters recognize that the cost of medical care is out of control, then the government will act.*

*(2) Most American voters have elderly relatives.*

---

*∴ Everyone who has elderly relatives recognizes that the cost of medical care is out of control.*

***Reading 3***

*(1) Everyone who has elderly relatives recognizes that the cost of medical care is out of control.*

*(2) Most American voters have elderly relatives.*

---

*∴ If most American voters recognize that the cost of medical care is out of control, then the government will act.*

Think about the meaning of the premises and conclusion in each case. *Does the conclusion follow from the premises?* In reading 1, for instance, the premises offer no reason for believing that "most Americans voters have elderly relatives." Although this statement might follow from the premises in some *other* argument, the premises supplied here are irrelevant. In each of the other readings, the premises also fail to give reasons that adequately support the conclusion. Such a mechanical process of developing alternative readings for an argument might seem overly cumbersome, but working through it a few times will help you begin to get a feel for argument structure and to sharpen your sense of whether a conclusion has been explicitly stated or left implicit.

Because in this case we have found that the conclusion is not explicitly stated, our next step is to formulate the implicit conclusion. To discover the hidden conclusion that the premises support, you will often find it useful to list the premises.

***Reading 4***

*(1) If most American voters recognize that the cost of medical care is out of control, then the government will act.*

*(2) Everyone who has elderly relatives recognizes that the cost of medical care is out of control.*

*(3) Most American voters have elderly relatives.*

---

*∴ ???*

Think about what statement these premises jointly support and how they are linked. The second and third premises together support the statement that most American voters recognize that the cost of medical care is out of control. This taken with the first premise supports the conclusion of the entire argument: "The government will act."

Reading 4 illustrates two important features of a good reconstruction for arguments with missing elements. First, it strives, *other things being equal,*[2] to interpret the argument in such a way that *the conclusion does indeed follow from the premises*. In this reading the conclusion follows from the premises, whereas in each of the other three readings, the supposed conclusion does not follow from the premises. Further, it is difficult to find acceptable implicit premises that could be used to support these "conclusions." Second, the argument *uses all stated premises.* Notice the way reading 4 uses all three premises to support the conclusion and compare this reading with the following reading, which makes some of the premises contained in the passage unnecessary:

***Reading 5***

*(1) If most American voters recognize that the cost of medical care is out of control, then the government will act.*

***(implicit)*** *(2) If the government acts, then the reputation of the Congress will be enhanced.*

***(implicit)*** *∴ If most American voters recognize that the cost of medical care is out of control, then the reputation of the Congress will be enhanced.*

Reading 5 does not use all the available material in the passage. It picks out one element as a premise, disregards the rest, and reaches a conclusion that is not even hinted at in the passage. Of course, in order to do so, an implicit premise also needs to be added. In chapter 2 we encouraged applying the Principle of Charitable Interpretation, but attributing an argument that is not even suggested by the text is not providing an *interpretation* that is charitable, even if the argument is a good one.

## Understanding Arguments by Identifying Implicit Premises

More common than the argument with an implicit conclusion is the argument that presents a conclusion and some of the premises needed to support it but leaves out one or more statements necessary to guarantee the truth of the conclusion. These missing premises are sometimes referred to as *assumptions* or *presuppositions* of the argument.[3] Consider this example:

2. Other things are *not* equal if the passage actually suggests a reading in which the conclusion does not follow from the premises.

3. We might distinguish between an assumption and a presupposition this way: calling the missing premise an *assumption* interprets it as a position that is likely held but not stated by the arguer, whereas to call it a *presupposition* allows that the author of the argument may be unaware that this premise is required.

***Example 3.4***

*A law that would reduce the blood alcohol limit for driving is a bad idea, because anything that would put ordinary social drinkers in jail is a bad idea.*

The indicator word *because* flags the second statement in this sentence as a premise and the first as the conclusion. In standard form we have:

***Reconstruction 1***

*(1) Anything that would put ordinary social drinkers in jail is a bad idea.*

*∴ A law that would reduce the blood alcohol limit for driving is a bad idea.*

What is missing in this argument is the assumption that links the stated premise to the conclusion. As the argument is now written, it is assumed that a law that would reduce the blood alcohol limit for driving would put ordinary social drinkers in jail, an assumption that might well be doubted. This assumption is made explicit in the following version of the argument, which is easier to understand and to criticize.

***Reconstruction 2 (implicit)***

*(1) Anything that would put ordinary social drinkers in jail is a bad idea.*

*(2) A law that would reduce the blood alcohol limit for driving would put ordinary social drinkers in jail.*

*∴ A law that would reduce the blood alcohol limit for driving is a bad idea.*

Sometimes the missing premise is an assumption about the definition of some term in the argument. For example:

***Example 3.5***

*Abortion involves intentionally taking the life of an innocent person, so abortion is murder.*

What is missing here is a statement that characterizes *intentionally taking the life of an innocent person* as *murder.* Once this definitional assumption is made explicit, it is apparent that the conclusion follows from the premises.

The implicit premise in itself is not very controversial, although the argument might provoke debate.[4] Indeed, if you have a choice in adding implicit elements to an argument reconstruction, *the more plausible, less questionable statements should be selected.* In the argument in Example 3.5, for instance, the conclusion would still follow if we added a premise that the taking of a human life constituted murder, irrespective of whether it was done intentionally or involved an

4. The explicit premise would probably be the focus of concern because it is true only if we consider the fetus to be a full-fledged person. If not (as some maintain), then it is false to say that abortion involves taking the life of an innocent *person.*

innocent person. But in the context of the passage, which includes the words *intentionally* and *innocent,* such a reading would not be charitable.

Although the Principle of Charitable Interpretation enjoins us to add the most reasonable implicit premises or conclusions that can be plausibly attributed to the author, given what is stated in the passage, it need not be one that *we* believe is true. In fact, one of the advantages of reconstructing an argument is that we sometimes expose a hidden premise that is controversial, as in Example 3.6:

***Example 3.6***

*Stealing is wrong. Using a friend's car without asking is taking property without permission. So using a friend's car without asking is wrong.*

The implicit premise needed to reconstruct this passage can be stated: *Taking property without permission is (always) stealing.* This premise is, at best, doubtful. Special circumstances, such as an emergency or the absence of any intention to keep the car, suggest that sometimes taking property without asking permission is not an act of stealing.

***Reconstruction***

*(1) Stealing is wrong.*

*(2) Using a friend's car without asking is taking property without permission.*

***(implicit)***

*(3) Taking property without permission is stealing.*

*∴ Using a friend's car without asking is wrong.*

## Adding Both Conclusion and Premises

There are also cases in which both the conclusion and some of the premises are missing. In such cases the best way to begin is to supply what appears to be the intended conclusion and then to consider the premises needed as plausible assumptions to support it. In making this reconstruction, it is helpful to pay close attention to the context, as you can see in the following example:

***Example 3.7***

*Those who fear the future have misled us. If Americans will mobilize the forces that have made them great, then they will ultimately weather the problem of global economic competitiveness and develop effective new products and manufacturing techniques to meet the challenge.*

The editorial comment that those who fear the future have misled us indicates that the author would assert a conclusion that is not one of fear. The second clause of the next sentence—"they will ultimately weather the problem of global economic competitiveness"—offers hope, suggesting that this is the author's intended conclusion. This first step in reconstruction yields:

***Reading 1*** *(1) If Americans will mobilize the forces that have made them great, then they will ultimately weather the problem of global economic competitiveness and develop effective new products and manufacturing techniques to meet the challenge.*

***(implicit)*** *∴ Americans will ultimately weather the problem of global economic competitiveness and develop effective new products and manufacturing techniques to meet the challenge.*

What is missing from this formulation is the hidden assumption that Americans will indeed mobilize the forces that have made them great. The Principle of Charitable Interpretation directs us to understand the argument in this more fully developed way.

***Reading 2*** *(1) If Americans will mobilize the forces that have made them great, then they will ultimately weather the problem of global economic competitiveness and develop effective new products and manufacturing techniques to meet the challenge.*

***(implicit)*** *(2) Americans will mobilize the forces that have made them great.*

***(implicit)*** *∴ Americans will ultimately weather the problem of global economic competitiveness and develop effective new products and manufacturing techniques to meet the challenge.*

The implicit premise—premise 2—is the most controversial part of the argument. Only when it is made explicit can we criticize the contention effectively.

## Guidelines and Warnings in Adding Implicit Premises and Conclusions

Our discussion of the Principle of Charitable Interpretation in chapter 2 suggests guidelines for reconstructing arguments with missing elements. The general rules on page 54 apply when there is no *explicit* evidence to the contrary.

We followed these guidelines in our reconstructions in the previous sections. But our comments relied on a general understanding of the passages and a feel for the structure of arguments. Sometimes our insights into arguments fail us initially, particularly when passages are verbally complicated. Fortunately, there is a more mechanical process that can help in some cases. It takes advantage of the search for structure we described in chapter 2.

**Guidelines for Reconstruction**

Within the limits of faithfulness to the text, the reconstructed argument should:

1. Contain a conclusion that follows from the premises
2. Avoid false or highly questionable premises
3. Include all premises that are explicitly stated or strongly suggested[5]
   *(These may need to be rephrased in ways that make the entire argument fit into a pattern.)*
4. Include implicit premises that bring out underlying assumptions or presuppositions
   *Note: To follow all the guidelines at once, you must balance content and structure. An argument must be complete, but a statement or assumption cannot be included as part of the argument if it isn't connected to the other premises in a way that leads to the conclusion. Achieving this balance is to some extent an art. It requires practice.*

To apply guideline 1, a useful first step is to determine the structure of the argument as best we can. If we can see the argument as an instance of a successful argument pattern, we can get a better picture of what is needed to make the conclusion follow from the premises. Suppose we read the following selection from an essay in a magazine:

***Example 3.8***

*Television programming has become segregated: there are separate programs for and about blacks, whites, and Hispanics, with little overlap. The NAACP blames the networks for this situation, but the fault lies more with us than with the studios. Programming decisions are based on viewing habits and marketing. If segregated television continues to be aired, then we the public are choosing to watch it.*[6]

In this passage, the if-then structure of the last sentence can be recognized as occurring in some of the argument patterns discussed in chapter 2. But this sentence ("If segregated television continues to be aired, then we the public are choosing to watch it.") needs to be connected with the rest of the passage. The first sentence suggests that the author would assert the "if" part of the "if-then" sentence to be true. The claim that although the NAACP blames segregated

5. Often in "real-life" passages that contain arguments, much of the material serves other purposes than directly presenting the argument. Not every sentence corresponds to a premise or a conclusion; indeed, most do not. Hence, a good reconstruction *excludes all irrelevant material*. Nevertheless, some of the material—like illustrations or even the title—gives useful hints about the missing premise or conclusion.

6. Adapted from Tamar Jacoby, "Adjust Your Sets," *The New Republic,* 24 January 2000.

television on the studios, "the fault lies more with us than with the studios," suggests that the passage is presenting reasons why we, the public, deserve most of the blame for segregated television. If we put these elements together, we have the partial reconstruction:

***Partial Reconstruction***

*(1) Segregated television continues to be aired.*

*(2) If segregated television continues to be aired, then the public is choosing to watch it.*

---

*∴ The public deserves most of the blame for segregated television.*

This reconstruction has the structure

*(1) A.*

*(2) If A, then B.*

---

*∴ C.*

which we can recognize as needing the additional premise *If B, then C* to complete the pattern of the chain argument.

*(1) A.*

*(2) If A, then B.*

*(3) If B, then C.*

---

*∴ C.*

This allows us to complete the reconstruction of the argument.

***Full Reconstruction***

*(1) Segregated television continues to be aired.*

*(2) If segregated television continues to be aired, then the public is choosing to watch it.*

*(3) If the public is choosing to watch it, then the public deserves most of the blame for segregated television.*

---

*∴ The public deserves most of the blame for segregated television.*

These steps in using patterns to help reconstruct arguments are summarized on the next page.

As with all the Guidelines for Reconstruction, the recommendation to try to reconstruct the argument as an instance of a successful argument pattern provides only general criteria for evaluating alternative reconstructions. It cannot be

followed blindly. For some arguments or argument fragments, there is no way, *faithful to the text*, that allows us to reconstruct them so that the conclusion follows from the premises.

**Using Patterns to Reconstruct Arguments**

1. Look for structuring words or word pairs like *if . . . then*, *either . . . or, not*, *all,* or *every;* look as well for statements or parts of statements that are repeated.
2. Write out the partial pattern for the portion of the argument that is stated.
3. Determine what the complete pattern is.
4. From the part of the pattern that is missing, determine what statements are missing.

Notice that there is an *overly easy* way of adding a premise to complete any argument. It should be used only as a last resort. Let's use the following example of a partially reconstructed argument:

***Example 3.9***

*(1) No one who wants fame can be trusted.*

*(2) Edward is a journalist.*

---

*∴ Edward can't be trusted.*

It is always possible to write an if-then premise that connects the premises already stated with the conclusion. Using this procedure, we can complete Example 3.9 in this manner:

***Easy Way of Completing Example 3.9 (implicit)***

*(1) No one who wants fame can be trusted.*

*(2) Edward is a journalist.*

*(3) If no one who wants fame can be trusted and Edward is a journalist, then Edward can't be trusted.*

---

*∴ Edward can't be trusted.*

Using the easy way, we have made premises 1 and 2 into the "if" part of our added premise, and the conclusion into the "then" part. However, there is an alternative way of completing Example 3.9 that adheres more closely to guideline 4 from the list on page 54.

***Preferred Way of Completing Example 3.9 (implicit)***

*(1) No one who wants fame can be trusted.*

*(2) Edward is a journalist.*

*(3) All journalists want fame.*

---

*∴ Edward can't be trusted.*

This latter formulation is better because it states more specifically what is presupposed in the argument of Example 3.9. If you were to criticize the argument, the preferred reconstruction would direct you to scrutinize the claim that all journalists want fame. With the easy if-then reconstruction, you can see only that the argument presupposes some connection between the stated premises and the conclusion, but it is not clear what this connection is. The if-then premise—premise 3—simply restates the argument of Example 3.9 in a single sentence. You can just as easily question whether the conclusion of the argument follows from the premises as you can whether the if-then implicit premise is true. For this reason, the "easy" reconstruction violates guideline 4 because it does *not* bring out underlying presuppositions in a way that promotes critical discussion.

Picking out an *interesting, not overly easy*, implicit premise was relatively straightforward for the partially reconstructed argument in Example 3.9. But deciding what implicit premise to add in reconstruction in less stylized contexts can be a greater problem. If Example 3.9 were an argument embedded in a passage that focused on TV news becoming more like sensationalist, "tabloid" journalism, we might have added this to premise 2 and modified the implicit premise 3 to take this into account:

***(modified)*** *(2') Edward is a "tabloid" journalist.*

***(implicit)*** *(3') All "tabloid" journalists want fame.*

Alternatively, if the argument were embedded in a context that discussed the cutthroat competition in the market in which Edward worked, then another version of the implicit premises would be appropriate:

***(modified)*** *(2") Edward is a journalist in a cutthroat market.*

***(implicit)*** *(3") All journalists in a cutthroat market want fame.*

Notice that implicit premise 3 makes the boldest claim. It applies to "all journalists." The other two—3' and 3"—make less bold statements about all journalists of a certain type or working in a certain kind of market. These qualifications might make one version of a prospective implicit premise more defensible than

another. If, however, the passage gives no hint about such a more qualified version, then you are not required by the guidelines to supply it. At a certain point, the burden of clearly stating the argument falls on its author.

There is *no simple formula* for selecting which version of an implicit premise to include. Sometimes elements of the passage will suggest which version is more appropriate. Other times you will need to rely on the Principle of Charitable Interpretation and pick the version that seems most acceptable from among those that can be plausibly attributed to the author.

## Exercise 3.1 Recognizing Argument Patterns and Adding Implicit Premises, Conclusions, or Both

This exercise should help prepare you to identify premises and conclusions that are left unstated. It will give you practice in learning to apply the steps in Using Patterns to Reconstruct Arguments (p. 56) as well as the Guidelines for Reconstruction (p. 54). When it is not immediately obvious what premise or conclusion has been left unstated, identifying the pattern of the argument can be helpful.

1. Fill in the blanks and indicate the argument pattern given below.

**Sample:**

Suppose you are trying to identify the missing premise in this argument:

*(1) If Dan lied, then he kept the money for himself.*

*(2) [_____.]*

*∴ Dan didn't lie.*

As indicated in the box on page 56, to identify the pattern of an argument, look for words or word pairs like *if . . . then*, *either . . . or*, or *not,* and look for statements or parts of statements that are repeated in the argument. If we substitute *A* for *Dan lied* and *B* for *he [Dan] kept the money for himself,* we can represent the argument with the following "partial" pattern:

*(1) If A, then B.*

*(2) [_____.]*

*∴ Not A.*

Now compare this partial pattern to the list of complete patterns in chapter 2. Our partial pattern is a fragment of the following complete pattern:

*(1) If A, then B.*

*(2) Not B.*

*∴ Not A.*

The implicit premise, then, is: *Not B.* To put this into an English sentence, you have to find what *B* stands for in premise 1 and then deny that sentence. In this case, premise 2 is: *Dan did not keep the money for himself.* And the complete argument is:

*(1) If Dan lied, then he kept the money for himself.*

*(2) [Dan did not keep the money for himself.]*

*∴ Dan did not lie.*

***Write patterns here.*** Go through steps 1–4 in the box on page 56 for the following problems. We have helped you by filling in key words in some of the missing premises and conclusions.

a. *(1) If the Netwizard computer runs Webmeister software, then it can meet my computing needs.*

*(2) [ .]*

*∴ The Netwizard computer can meet my computing needs.*

b. *(1) Either [ ]*
*or I should buy the Hacker 1000 computer.*

*(2) I shouldn't buy the Netwizard computer.*

*∴ I should buy the Hacker 1000 computer.*

c. *(1) If the Hacker 1000 computer does not run Webmeister software, then I can't do word processing on it.*

*(2) If [ ],*
*then [ ].*

*∴ If the Hacker 1000 computer does not run Webmeister software, then it doesn't meet my computing needs.*

d. *(1) If David can afford a new computer,*
*then [ ].*

*(2) David can't afford to pay his debts.*

*∴ David can't afford a new computer.*

e. *(1) Either [ ]*
*or [ ].*
*(2) I shouldn't buy a Hacker 1000 computer.*

*∴ I should buy a Netwizard computer.*

f. *(1) If the Netwizard computer has only 64 Megs of RAM, then [ ].*
*(2) If it can't run Webmeister software, then I shouldn't buy it.*
*(3) [ .]*

*∴ I shouldn't buy it.*

g.[7] *(1) All Hacker 1000s are products guaranteed for three years.*
*(2) All [ ] are [ ].*

*∴ All Hacker 1000s are products that give you a lot of protection against faulty workmanship.*

h.[7] *(1) Any addition to my computer system is an extravagance.*
*(2) [ ] is [ ].*

*∴ A new color Laserspeed printer is an extravagance.*

***Write patterns here.*** The following exhibit more complicated patterns, not listed in chapter 2. Can you figure out the patterns they exhibit?

i. *(1) If the Netwizard computer can run Webmeister, and it is cheaper than the Hacker 1000, then I should buy it.*
*(2) [ .]*
*(3) [ .]*

*∴ I should buy the Netwizard computer.*

7. Fill the slots in these exercises with words that apply to classes of objects (for example, "Hacker 1000s") or that designate a particular object belonging to a class (for example, "my Hacker 1000"). Do not insert a complete sentence into the slots for these exercises.

j. *(1) Either I'll spend my bonus on a new computer, or I'll replace my bald tires (but not both).*

*(2) If I do not replace my bald tires, then I risk a serious accident.*

*(3) [_____.]*

*∴ I won't spend my bonus on a new computer.*

k. *(1) Either I should buy more books or more computer games.*

*(2) If this money was given to me for my education, then I should not buy more computer games.*

*(3) [_____.]*

*∴ I should buy more books.*

2. Put the following arguments into standard form. Add implicit premises and conclusions. Leave out any editorial comments. For problems a–j, indicate the argument pattern, using letters to represent repeated elements.

   a. You promised to be here at 8:00. If you promised to be here at 8:00, then you should have arrived at 8:00.
   b. I should either study more or prepare to accept failure. I should study more.
   c. If you tell lies frequently, then you must remember not only what you have done but also what you said you have done. Therefore, if you tell lies frequently, your memory becomes burdened.
   d. Harold should be sensitive to other people because any teacher should be sensitive to other people.
   e. American universities are eroding their public support. Any social institution that spends beyond the willingness of the public to pay is eroding its public support.
   f. If being affectionate were the only important virtue, then Maurice would be a saint. So being affectionate is obviously not the only important virtue.
   g. We will face substantial energy shortages by the year 2020 because there are not enough nuclear power stations under construction. *(Note:* Sometimes there is no alternative to adding the easy linking premise: *"If premise 1, then conclusion.")*
   h. Many college faculty members are reaching retirement age. But if that is so, then many new, younger faculty members will be hired. It follows that, before long, college faculties will become more energetic.
   i. Every successful politician has to compromise his principles occasionally. Everyone who has to compromise his principles occasionally loses integrity.
   j. The number of unmarried adults in the United States is continuing to increase. If there is an increase in people unsupported by close personal

bonds, there will be an increase in alcoholism and suicide. So there will be an increase in alcoholism and suicide.

Passages k–q do not fit into the common patterns of argument we have considered previously. Reconstruct them in standard form.

k. The burglar was under five feet tall, so Albert was not the burglar.
l. The higher the interest rates, the better the bank. The interest rates at CASH National Bank are the highest in town.
m. Apparently you don't smoke opium, since everyone who smokes opium is happy.
n. Either I should spend my tax refund on paying off my debts or I should buy books for this term. But if I don't buy books, I'll risk failing my courses. So I shouldn't spend the refund on paying off my debts.
o. It looks like Bruce will get a promotion. Alice has a great new job in Minneapolis. If so, she'll be moving, and that will create an opening for either Bruce or Frank.
p. Every human action is determined by laws of nature. But for a person to deserve praise or blame, it is necessary for the person to have been able to act differently than she in fact did act. So no person deserves praise or blame.
q. The industrialized nations will resolve the environmental crises that are looming in the near future if these nations mobilize all the technological resources at their disposal. If political incentives are sufficiently high, then the mobilization of resources will occur. Public awareness about oil spills, depletion of the ozone layer, and the "greenhouse effect" is growing rapidly. If so, political incentives are sufficiently high. The conclusion is clear.

In the following passages much of what is stated is either not part of the argument or must be restated to make the structure of the argument clear. There may be more than one acceptable reconstruction.

r. As we all know, the American public is reluctant to try any new approach to education that might erode support for public schools. But the problems of education in inner cities have become so critical that there is little to lose. Either we give the voucher system a fair trial, or we abandon the potential of the children of inner cities to become educated.
s. If a bad environment causes people to become criminals, then everyone from a bad environment would be a criminal. But for every criminal who comes from a bad environment, there are thousands who hold jobs.
t. We have before us the question of rights for homosexuals—a question which I hope disturbs you as much as it does me. My friends, I am as much concerned about other people as anyone. But I am opposed to these so-called rights. The reason is that if the United States passed rights for homosexuals, then the United States would support what is unnatural. But the United States should never support what is unnatural.

3. Use the Guidelines for Reconstruction to determine which, if any, of the reconstructions provided are adequate for the passages given. Indicate why you reject the reconstructions you do. If you find all of them faulty, supply one yourself.

a. *Passage*

Either we should cut taxes or we should use this opportunity to preserve Social Security and expand medical coverage. If we cut taxes now, we will be unable to fund these programs when the need inevitably arises. The conclusion is clear.

*Reconstructions*

i. *(1) Either we should cut taxes, or we should use this opportunity to preserve Social Security and expand medical coverage.*

*(2) We shouldn't preserve Social Security and expand medical coverage.*

*∴ We should cut taxes.*

ii. *(1) Either we should cut taxes, or we should use this opportunity to preserve Social Security and expand medical coverage.*

*(2) If we cut taxes now, we will be unable to fund Social Security and expanded medical coverage when the need inevitably arises.*

*(3) We should not be unable to fund Social Security and expanded medical coverage when the need inevitably arises.*

*∴ We should use this opportunity to preserve Social Security and expand medical coverage.*

iii. *(1) We should preserve Social Security and expand medical coverage.*

*(2) We have an obligation to those who paid into Social Security, and it would be inhumane to leave our citizens without medical insurance.*

*∴ We shouldn't cut taxes.*

b. *Passage*

I don't care what you say: if it's wrong to discriminate against a woman on the basis of her gender, then it is equally wrong to discriminate against a man on the basis of his. Permitting combat roles in the military for men only is unjust.

*Reconstructions*

i. *(1) If gender discrimination is wrong, then combat roles for men only are unjust.*
*(2) Combat roles for men only are unjust.*
*∴ Gender discrimination is wrong.*

ii. *(1) If it is wrong to discriminate against a woman on the basis of her gender, then it is equally wrong to discriminate against a man on the basis of his.*
*(2) Combat roles for men only discriminate against a man on the basis of his gender.*
*∴ Combat roles for men only are unjust.*

iii. *(1) If gender discrimination against women is wrong, then it is unjust to discriminate against a man on the basis of his gender.*
*(2) Gender discrimination against women is wrong.*
*∴ Combat roles for men only are unjust.*

c. *Passage*

Since Mervin has devoted himself to becoming a famous journalist, you should be careful what you tell him.

*Reconstructions*

i. *(1) If Mervin has devoted himself to becoming a famous journalist, you should be careful what you tell him.*
*(2) Mervin has devoted himself to becoming a famous journalist.*
*∴ You should be careful what you tell Mervin.*

ii. *(1) If Mervin has devoted himself to becoming a famous journalist, all people should be careful what they tell him.*
*(2) Mervin has devoted himself to becoming a famous journalist.*
*∴ All people should be careful what they tell Mervin.*

iii. *(1) Everyone should be careful what they tell anybody who wants to become a famous journalist.*

*(2) Mervin has devoted himself to becoming a famous journalist.*

*∴ Everyone should be careful what they tell Mervin.*

d. *Passage*

Reliance on abortion as a means of birth control will cheapen the American social commitment to protecting life. It should be banned except when the mother's life is in danger.

*Reconstructions*

i. *(1) If reliance on abortion as a means of birth control will cheapen the American social commitment to protecting life, then it should be banned except when the mother's life is in danger.*

*(2) Reliance on abortion as a means of birth control will cheapen the American social commitment to protecting life.*

*∴ Abortion should be banned except when the mother's life is in danger.*

ii. *(1) Anything that cheapens the American social commitment to protecting life should be banned.*

*(2) Abortion as a means of birth control cheapens the American social commitment to protecting life.*

*∴ Abortion should be banned.*

iii. *(1) Anything that cheapens the American social commitment to protecting life should be banned.*

*(2) Except when the mother's life is in danger, abortion cheapens the American social commitment to protecting life.*

*∴ Abortion should be banned except when the mother's life is in danger.*

## What's the Point? Understanding Complicated Passages in Context

In passages that contain a good deal of argumentative material, it is often surprisingly difficult to determine exactly what point an author is trying to make. We briefly alluded to this problem in chapter 2. You might face difficulty, for

instance, in finding the conclusion in the midst of all the other statements in the passage. Furthermore, the distinction between explicit and implicit premises and conclusions is not always sharp. A premise or conclusion can be strongly suggested but not stated precisely. You will seldom be able to copy a series of sentences from a passage and say, "These are the premises and the conclusion."

Even if, using indicator words and seeing the structure of an argument, you find a sentence that plays the role of the conclusion, you might not initially understand what the author means by it and how the premises support it. What does the author mean in the following passage?

***Example 3.10***

*Social scientists have rightly held that people who are intermeshed in a network of overlapping, mutually supportive interpersonal relations and the concomitant commitment to common norms obtain a substantial measure of psychic support. This psychological fortification in turn limits the incidence of self-destructive and other deviant behavior. It follows that individuals with a high degree of involvement with the religious life of their community are less likely to be found on the lists of those who have taken the last fateful step to terminate their sojourn in this vale of tears.*

**Looking at the Context** When you are trying to understand an unclear passage, it is often useful to look at the context in which it appears. Is the passage part of an article whose main point is stated in the title? If so, how is the passage in question related to this point? Is the passage part of a debate in which the participants have clearly indicated which side they are supporting? If so, perhaps the passage is stating premises in support of one of the positions. If the passage in Example 3.10 were from a book, and it occurred in a chapter titled "Religion and Suicide," you could look for some point about the relation between religion and suicide. This additional information doesn't tell you specifically what the passage means, but it prepares you to focus your attention in a certain direction as you read through it.

**Simplifying and Paraphrasing** To cut through the net of confusion created by passages such as the one in Example 3.10, it is helpful, after noting the context, to simplify and paraphrase. Once inessential elements are removed or modified, you can more readily grasp the structure of what is being said. Furthermore, a sign of whether you have mastered an argument is your ability to repeat what is meant—not merely the words used. This is a good test of understanding.

The task of simplifying and paraphrasing is not easy. The aim is to change an author's words without distorting the meaning of what was said. It is all the more difficult if you do not clearly understand what the author is saying. *Successive approximation* is a useful tactic. Begin with a rough (perhaps somewhat inaccurate) rendition of the passage. Then, if necessary, modify it in successive versions until it accurately reflects the original. In the process you will "make the author's argument your own" and understand it much better.

**A First Approximation** The conclusion in Example 3.10 is indicated by the expression "it follows" in the final sentence, but its meaning is far from clear. Once the conclusion is located, a three-step process will help generate a first approximation:

1. ***Penetrate the Prose***. Look up the words you don't know in a dictionary; decipher the meaning of metaphors and of vague, emotional, or flowery language; substitute more precise expressions.

   *Sample:* The conclusion of the example uses the fancy phrase "those who have taken the last fateful step to terminate their sojourn in this vale of tears" which means roughly "those who committed suicide."

2. ***Eliminate the Excess***. Delete all editorial expressions or unnecessary clauses, and rephrase what remains in a straightforward way.

   *Sample:* The introductory comment "Social scientists have rightly held" should be removed.

3. ***Search Out the Structure***. Figure out which statements provide support for the conclusion. If necessary, sketch the argument in such a way that the structure is clear.

   The argument can be sketched:

***First Approximation (implicit)***

*(1) People with many friends feel more secure.*

*(2) Feeling secure makes people less suicidal.*

*(3) Churchgoers have many friends.*

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*∴ Churchgoers are less suicidal.*[8]

When you reconstruct a passage it is important to make a bold beginning. Don't be afraid to produce a very rough approximation. It is better to produce a parody that you truly understand than a parroting of the author's words that you do not. You can always revise your simplified version if you decide that you have weakened or significantly altered what the author is saying.

**A Second Approximation** Our first approximation is much clearer than the original, but it is an oversimplification that is probably more open to criticism than the original. For example, it is an overgeneralization to say that churchgoers have many friends, and the passage doesn't make this bold a claim. It was

8. We could go a step further and put these sentences into an if-then pattern—for example, by writing the first premise as *If people have many friends, then they feel more secure than people without many friends.*

worthwhile to put it this way in the first approximation because it is a simple, clear statement that connects the conclusion with the premises. If we go through our first approximation and qualify each sentence so it is closer to the original (but stated clearly), we arrive at something like the following:

*(1) People who share a network of relationships and norms feel more secure.*

*(2) Feeling secure limits self-destructive behavior.*

*(3) People highly involved in religious life are likely to share a network of relationships and norms.*

---

*∴ People highly involved in religious life are less likely to commit suicide.*

Even though this second approximation is more accurate, it is important to go through the initial step of oversimplifying the passage. This helps you move beyond reciting the words of the passage as you would recite words in a poem you have memorized but don't understand. By oversimplifying the passage you take over the thought as if it were your own. You can always go back and qualify.

## Exercise 3.2 Simplification and Paraphrasing: Making a First Approximation

Simplify and paraphrase the following passages. Try to capture the basic meaning as economically as you can. For the first approximation do not hesitate to substantially rewrite the passage and to eliminate less important elements. The passages need not be read as arguments.

1. Few are the rewards of indolence and many its pains; rich is the harvest of hard work.
2. If you want to get ahead in this world, you've got to be down at the carwash when the fancy cars roll in.
3. Only by cleaving firmly to the bosom of the land can the new pioneer escape the soul-crushing forces of modern, technological society.
4. A full-bodied network of communication is necessary for any officeholder if he or she is to effectively transform crucial, but unexciting, behind-the-scenes work into the forge that will produce results at the polls.
5. Success in teaching rests on three interrelated factors: (1) A teacher must have that easy familiarity that betokens the true participant in the life of the mind; (2) a teacher must be involved in a give-and-take nexus of communication with the student so that the student is motivated and the teacher is apprised of the student's needs; and finally (3) a teacher must be able to evaluate both

the student's progress and potential without bias in light of the teacher's own successes and failures in the classroom.

6. To UNDERSTAND political power right and derive it from its original, we must consider what state all men are naturally in, and that is a state of perfect freedom to order their actions and dispose of their possessions and persons as they think fit, within the bounds of the law of nature, without asking leave or depending upon the will of any other man.[9]

7. Yet all this bespeaks a dim realization of the truth—the truth that modern man lives under the illusion that he knows what he wants, while he actually wants what he is *supposed* to want. In order to accept this it is necessary to realize that to know what one really wants is not comparatively easy, as most people think, but one of the most difficult problems any human being has to solve. It is a task we frantically try to avoid by accepting ready-made goals as though they were our own.[10] **(Hint: Does Fromm believe that people really know what they want?)**

8. It would seem that the obstacles to generalized thought inherent in the form of language are of minor importance only, and that presumably the language alone would not prevent a people from advancing to more generalized forms of thinking if the general state of their culture should require expression of such thought; that under these conditions the language would be molded rather by the cultural state. It does not seem likely, therefore, that there is any direct relation between the culture of a tribe and the language they speak, except insofar as the form of language will be molded by the state of culture, but not insofar as a certain state of culture is conditioned by morphological traits of the language.[11] **(Hint: What does Boas say about the relation among language, thought, and culture?)**

9. No age in the history of humanity has perhaps so lost touch with this natural *healing* process that implicates *some* of the people whom we label schizophrenic. No age has so devalued it, no age has imposed such prohibitions and deterrences against it, as our own. Instead of the mental hospital, a sort of reservicing factory for human breakdowns, we need a place where people who have traveled further and, consequently, may be more lost than psychiatrists and other sane people, can find their way further into inner space and time, and back again. Instead of the *degradation* ceremonial of psychiatric examination, diagnosis, and prognostication, we need, for those who are ready for it (in

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9. John Locke, *The Second Treatise of Government*, ed. Thomas Peardon (New York: Bobbs-Merrill, 1952), 4.
10. Erich Fromm, *Escape from Freedom* (New York: Avon, 1967), 278.
11. Franz Boas, *The Mind of Primitive Man* (New York: Collier, 1911), 67.

psychiatric terminology, often those who are about to go into a schizophrenic breakdown), an *initiation* ceremonial, through which the person will be guided with full social encouragement and sanction into inner space and time, by people who have been there and back again. Psychiatrically, this would appear as ex-patients helping future patients go mad.[12] **(Hint: Concentrate on the virtue Laing sees in the alternative rather than on the liabilities of traditional psychiatric practice.)**

10. If information is power, the ability to distort and control information will be used more often than not to preserve and perpetuate that power. But the national security policy makers, the crisis managers of the nuclear age, are frequently men of considerable intellectual ability who have gone to the right schools. They pride themselves not only on their social graces, but on their rationality and morality. For such men, the preservation of partisan political power would not be a seemly rationale for official deception (although it might be entirely sufficient for the President whom they serve). National security provides the acceptable alternative, the end that justifies all means. . . . The excuse for secrecy and deception most frequently given by those in power is that the American people must sometimes be misled in order to mislead the enemy. This justification is unacceptable on moral and philosophical grounds, and often it simply isn't true. Frequently, the "enemy" knows what is going on, but the American public does not.[13] **(Hint: According to Wise, how do government officials justify secrecy? Does Wise think this is an acceptable justification?)**

## Fine Tuning: Paraphrase and the Structure of Arguments

In the previous section we concentrated on shortening passages to clarify meaning. Although such paraphrasing is helpful as a first step in understanding a variety of prose materials, our primary concern is illuminating arguments embedded in complex passages. They are the focus of the remainder of this chapter.

Often, only a small fraction of a passage actually conveys an argument. The remainder may consist of material designed to make the audience sympathetic with the position taken, statements intended to clarify the position, support for premises, and so forth.

12. R. D. Laing, *The Politics of Experience* (New York: Random House, 1967), 88–89. Copyright © R. D. Laing, 1967. Reprinted with permission of Penguin Books Ltd.

13. David Wise, *The Politics of Lying: Government, Deception, Secrecy, and Power* (New York: Random House, 1973), 501. Reprinted with permission of the publisher.

**Finding an Argument in a Sea of Words** Example 3.11 illustrates the problem you face when you try to apply techniques of reconstruction to more complicated passages. It is a short selection consisting of eight sentences (marked Sl, S2, and so on) of the kind you might find in a newspaper.

***Example 3.11***

**Activists Pit Civil Rights Against First Amendment**

*S1→* *Women activists have developed a new strategy in their fight against pornography. They are seeking to use civil rights laws to attack what they consider exploitation of women that is promoted by pornographic materials.* *←S2*

*S3→* *In Minneapolis, Minnesota, these women successfully shepherded a measure through the City Council that would have opened the door for court action against any purveyor of films, magazines, or books that explicitly depict the sexual exploitation of women. Although the mayor ultimately vetoed the proposed ordinance, the movement in Minneapolis and elsewhere in the country is growing as a result of impetus from both the feminist movement on the left and a new, public concern with morality on the right.* *←S4*

*S5→* *Opponents argue that the definition of pornography implicit in such laws is a grave threat to First Amendment rights of free expression. These critics point out that ironically enough such ordinances could eliminate so-called Harlequin Romances that are widely purchased by women.* *←S6*

*S7→* *The conflict between these two positions is likely to remain unresolved until the U.S. Supreme Court rules on the constitutionality of provisions such as those in the Minneapolis ordinance. Another such case is brewing in Indiana.* *←S8*

Although a headline is provided and the word *argue* is actually included in S5, it is not immediately obvious what argument is being presented or, indeed, whether any argument is being put forward. Many of the sentences (for example, Sl, S2, S3, and S8) set the scene by offering a *description* of a state of affairs. Sentence 4 provides some description (namely, the mayor's veto), but it does something else as well: it offers an *explanation*[14] concerning why the movement is growing by pointing to support that extends across the political spectrum.

14. The distinction between *explanation* and *argument* is discussed in chapter 9.

Sentences 5 and 6 present the most tempting candidates for a deductive argument. They would form the conclusion and premise of a valid argument with the addition of an implicit premise that any law that prohibits widely read books is a threat to First Amendment rights of free expression. But note that the author is not offering this argument herself. It is a *reported argument* from another source, which is not endorsed (or rejected) in the article. Finally S7, although it might seem like a conclusion, is not really argued for in the passage. No direct reasons are given for believing that the conflict will demand Supreme Court action. The statement is *unsupported in the context* of the passage. What about the headline? Is that a conclusion supported by the article? The passage itself describes a conflict in which one side appeals to civil rights and the other side appeals to the First Amendment. The headline is best construed as a *summary* of the overall content rather than as a conclusion for which reasons are offered.

This example illustrates several roles that statements can play other than as premises or conclusions in arguments. They can be:

descriptions

explanations

reports of arguments

statements unsupported in context

summaries

These are just some of the common tasks performed by sentences in typical passages that you are apt to come across in your search for arguments. We could add a few additional items also encountered frequently:

editorial comments

illustrations, examples, or classifications

analogies

This list of roles statements can play should alert you to an important rule of thumb to guide you when you are looking for an argument in a piece of prose: *Much of what you find in prose passages is not part of an argument.*

Students in informal logic courses are often dismayed when they are asked to move beyond simplified classroom examples to essays, editorials, speeches, and other "real-world" passages. They read paragraph after paragraph without finding any arguments. But this should not be surprising when you consider how many roles a statement can play.

*A Useful Tactic: Finding the Conclusion First.* A useful first step when we are faced with a passage that contains much nonargument prose is to pick out the conclusion, find some statement or statements that seem to support the conclu-

sion most directly, and then add whatever implicit premises are necessary. (Keep the argument patterns in mind.)

We can apply this method to the following passage:

***Example 3.12***

> *Well, I insist—and I here follow von Hildebrand—that we parents, we married people, in no way believe sex is dirty, but we believe it is private and intimate. Therefore, it cannot endure being publicized the way mathematics or even the way health is publicized. It is quite tactful for you to go to a party and talk about your tonsils. It is not tactful—not acceptable—for you to go to a party and talk about how your wife makes love to you, not because you think it is dirty, my friends, but because you think it is intimate.*[15]

In looking for the conclusion, the indicator word *therefore* directs our attention to the statement, "It [sex] cannot endure being publicized the way mathematics or even the way health is publicized." We can paraphrase what is essential here in a much simpler way:

***Conclusion***

*Sex should not be publicized.*

Now we need to look through the passage to see what is offered as direct support for this conclusion. It is crucial to avoid simply listing all the sentences in the passage as though they were premises. Boil the passage down until it can be fit into a structured argument such as those represented by the patterns in chapters 2 and 4. In the first two lines, the author claims that she does not believe that sex is dirty. We can ignore this material for the purpose of reconstructing the argument, since we want to locate what she *does* believe in support of her conclusion. The second line presents a likely candidate, which we can write as a premise: *It (sex) is private and intimate*. So far, then, we have:

***Example 3.13***

*(1) Sex is private and intimate.*

---

*∴ Sex should not be publicized.*

Look at the remainder of the passage. It presents an example of something that may be publicized and claims again (in different words) that sex should not be publicized. None of this adds to the argument. What we need to get from the premise to the conclusion is a *general rule.* With a little thought you can see that the premise the passage leaves implicit is: Whatever is private and intimate should not be publicized. Adding this, we have:

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15. Quotation cited in Gloria Lentz, *Raping Our Children: The Sex Education Scandal* (New Rochelle, NY: Arlington House, 1972), 76.

***Example 3.14*** *(1) Sex is private and intimate.*

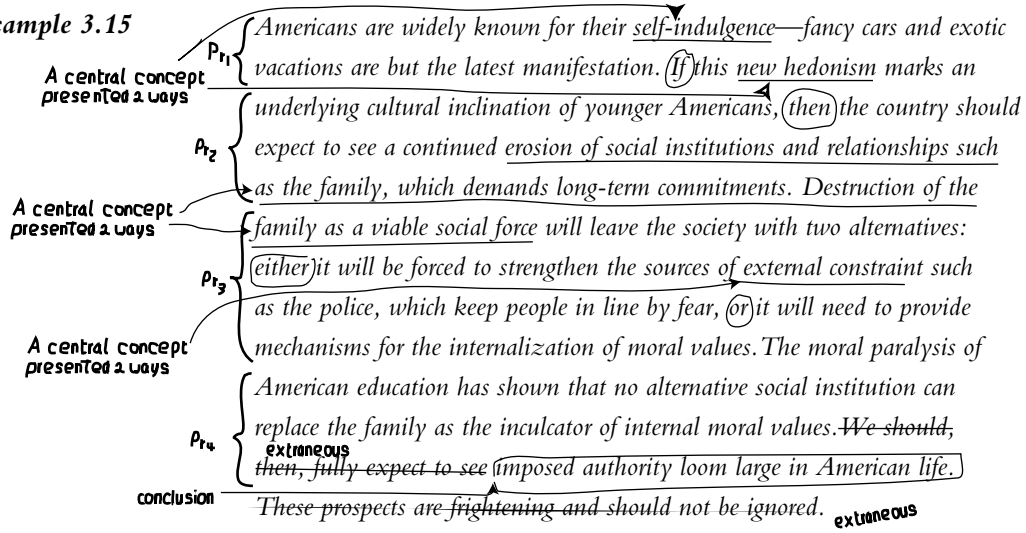
***(implicit)*** *(2) Whatever is private and intimate should not be publicized.*

---

*∴ Sex should not be publicized.*

For the purpose of reconstructing arguments, first approximations need not be written out in full. You may find it easier to penetrate the prose if you mark up the passage to indicate the central concepts (this might also involve noting whether the same concept is presented in different words). You can eliminate excess by simply crossing out irrelevant elements. And you can focus on argument structure by using some notation to check off "logical words" (such as *if . . . then, either . . . or, not, all,* and any indicator words). You can supplement these steps by identifying premises and conclusions. We have done this for the following passage, which offers a view of contemporary American culture.

***Example 3.15***




*Americans are widely known for their self-indulgence—fancy cars and exotic vacations are but the latest manifestation. If this new hedonism marks an underlying cultural inclination of younger Americans, then the country should expect to see a continued erosion of social institutions and relationships such as the family, which demands long-term commitments. Destruction of the family as a viable social force will leave the society with two alternatives: either it will be forced to strengthen the sources of external constraint such as the police, which keep people in line by fear, or it will need to provide mechanisms for the internalization of moral values. The moral paralysis of American education has shown that no alternative social institution can replace the family as the inculcator of internal moral values. ~~We should, then, fully expect to see~~ imposed authority loom large in American life. ~~These prospects are frightening and should not be ignored.~~*

Once the passage has been analyzed in this way, it is easier to write out a sketch of the argument. This sketch might use just sentence fragments to display the main links. It is important to keep these elements relatively simple in the first stage of reconstruction so that you can easily understand the general "drift" of the argument.

***Example 3.16*** ***Argument Sketch of the Passage About American Culture***

*(1) Americans are self-indulgent.*

*(2) If self-indulgent, then erosion of values.*

*(3) If erosion of values, either internal or external constraint.*

*(4) No internal constraint.*

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*∴ External constraint.*

The reconstructions of Examples 3.12 and 3.15 illustrate how passages often demand extensive revision. In reconstructing an argument, as in paraphrasing single sentences, we have two conditions to meet: (1) the reconstruction should capture the apparent meaning of the original and (2) the reconstruction should provide more clarity. For any given argument, these guidelines can be satisfied by a number of different acceptable reconstructions.

***Reconstructing Arguments with Subordinate Conclusions*** Many passages contain several interrelated arguments. A reconstruction of such a passage may be presented in two different ways: (1) as several distinct arguments or (2) as a composite, continuous argument in which some statements are both a subordinate (or intermediate) conclusion and a premise.

***Example 3.17***

*(S1) A social policy promoting abortion will inevitably lead to greater violations of the rights of the person. (S2) Such a consequence will undermine the mutual respect for the humanity of fellow citizens upon which democratic society is based. (S3) Any policy that destroys social bonds in this way threatens the society that engages in it. (S4) Hence a social policy promoting abortion threatens democratic society.*

This passage can be reconstructed in two ways.

***Reconstruction 1 (Two Separate Arguments)***

***(from S1)*** $(Pr_1)$ *A social policy promoting abortion will inevitably lead to greater violations of the rights of the person.*

***(rewrite of S2)*** $(Pr_2)$ *A social policy that leads to greater violations of the rights of the person will undermine the mutual respect for the humanity of fellow citizens upon which democratic society is based.*

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***(implicit subordinate conclusion)*** *(C) ∴ A social policy promoting abortion will inevitably undermine the mutual respect for the humanity of fellow citizens upon which democratic society is based.*

***(conclusion from first argument)*** $(C_1)$ *A social policy promoting abortion will inevitably undermine the mutual respect for the humanity of fellow citizens upon which democratic society is based.*

***(rewrite of S3)*** $(Pr_3)$ *Any policy that undermines the mutual respect for the humanity of fellow citizens upon which democratic society is based threatens the democratic society that practices it.*

***(rewrite of S4)*** *(C)* ∴ *A social policy promoting abortion will inevitably threaten the democratic society that practices it.*

***Reconstruction 2 (as a Continuous Argument)***

$(Pr_1)$ *A social policy promoting abortion will inevitably lead to greater violations of the rights of the person.*

$(Pr_2)$ *A social policy that leads to greater violations of the rights of the person will undermine the mutual respect for the humanity of fellow citizens upon which democratic society is based.*

***(subordinate conclusion)*** *(C)* ∴ *A social policy promoting abortion will inevitably undermine the mutual respect for the humanity of fellow citizens upon which democratic society is based.*

$(Pr_3)$ *Any policy that undermines the mutual respect for the humanity of fellow citizens upon which democratic society is based threatens the democratic society that practices it.*

***(main conclusion)*** *(C)* ∴ *A social policy promoting abortion will inevitably threaten the democratic society that practices it.*

Whenever we strive to simplify or rewrite what someone else has produced, we run the risk of distorting what that writer said. The method of first approximation is a crude instrument designed to make rough cuts. Once we have discovered the basic structure, we can go back and paraphrase the argument more sensitively, thus capturing some of the subtleties we might have previously ignored. It is too easy for us to be lost in a forest of words when we face a complex passage. Simplification, paraphrase, and argument sketches are ways of finding our way through it.

## Exercise 3.3 Putting All This into Practice

1. Reconstruct the arguments contained in the following passages. Simplify or paraphrase whenever possible. Add implicit conclusions or premises, or both, as needed. Most of the arguments can be reconstructed in several different ways.

a. We can't restore democracy to Haiti. We can't restore democracy when it never existed.[16]

b. A woman can now determine early in her pregnancy whether her baby will be a boy or girl. This raises the possibility of having an abortion simply because of the gender of the fetus. But such an action would clearly be wrong. Testing fetuses to determine whether they will become healthy babies is legitimate. But because the information might be misused, doctors should not be allowed to inform the parents of the gender of their fetus.

c. Well, I insist—and I here follow von Hildebrand—that we parents, we married people, in no way believe sex is dirty, but we believe it is private and intimate. Therefore, it cannot endure being publicized the way mathematics or even the way health is publicized. It is quite tactful for you to go to a party and talk about your tonsils. It is not tactful—not acceptable—for you to go to a party and talk about how your wife makes love to you, not because you think it is dirty, my friends, but because you think it is intimate.[17] **(Hint: Go beyond the analysis given in the text. Treat this as an argument against sex education classes in the schools.)**

d. There is a continuity of development from the moment of conception on. There are constant changes in the foetal condition; the foetus is constantly acquiring new structures and characteristics, but there is no one stage which is radically different from any other. Since that is so, there is no one stage in the process of foetal development, after the moment of conception, which could plausibly be picked out as the moment at which the foetus becomes a living human being. The moment of conception is, however, different in this respect. It marks the beginning of this continuous process of development and introduces something new which is radically discontinuous with what has come before it. Therefore, the moment of conception, and only it, is a plausible candidate for being that moment at which the foetus becomes a living human being.[18] **(Hint: Try using the implicit premise that either the fetus becomes human at the moment of conception or it becomes human at some moment thereafter.)**

e. African-Americans have been subject to centuries of racism. Today, some blame the victims for the problems of our country. Don't they know that most African-Americans are hardworking, good citizens? . . . That important parts of American culture—from music to language to literature to fashion—have been created by African-Americans. I insist: All collective

16. CBS Sunday Evening News, July 17, 1994.

17. Cited in Gloria Lentz, *Raping Our Children: The Sex Education Scandal* (New Rochelle, NY: Arlington House, 1972), 76.

18. Baruch Brody, "On the Humanity of the Foetus," *Abortion: Pro and Con,* ed. Robert Perkins (Cambridge, MA: Shenkman, 1974), 70–71.

judgments are wrong. Only racists make them. And racism is stupid, just as it is ugly. Its aim is to destroy, to pervert, to distort innocence in human beings and their quest for human equality.[19]

f. A.L.T. Allen has been thinking about inner-city crime and violence and family deterioration. She's read the politicians, the sociologists and the pundits. And she thinks everybody has it wrong. ". . . The emphasis has been on the African-American male"—as the missing father and as the perpetrator and victim of violence. Says Allen: "It occurs to me that perhaps we are focusing on the wrong group. Our efforts should be aimed at reaching not the males, but the females. . . As long as women tolerate this behavior in men, it will continue. As long as women continue to have relationships with, and continue to bear the children of, men who do not marry them, men will continue to be absent fathers.[20]

g. Urban social programs can produce results, often enough to justify their costs. But none has shown a large impact on poverty. None can emancipate poor individuals and families from the personal problems of early pregnancy, crime and social failure that shackle them. . . . Choice or privatization can often improve the effectiveness of programs, but "empowerment" as a basis for anti-poverty policy tends to presume exactly what is questionable—the poor can be competent managers of their own lives. If poor adults behaved rationally they would seldom be poor for long in the first place. Opportunity is more available than the will to seize it. . . . The effect of racial bias is mainly to limit the quality of jobs blacks can get, not to deny them employment. . . . Without a "smoking gun," America cannot cure poverty with traditional reformism of either the left or right. Merely to expand government spending on the poor, or to cut it back does not motivate the entrenched poor to take available jobs. That is why neither the Great Society nor the Reagan era succeeded in overcoming poverty. Instead the nation needs a more authoritative social policy in which the needy are told how to live instead of merely being subsidized.[21]

h. If reporters want to get at the truth, they cannot continue to act as if only one side in this debate [over passive smoking] has an ax to grind. They need to be just as skeptical about the EPA and the Coalition on Smoking or Health as they are about Philip Morris. . . . Writing in *Toxicologic Pathology*, Yale epidemiologist Alvan Einstein cautioned his fellow scientists against

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19. Elie Wiesel, "Have You Learned the Most Important Lesson of All?" *Parade Magazine,* 24 May 1992, 5. Elie Wiesel is a Nobel Peace Prize recipient.

20. William Raspberry, "Hope for a Decent Society May Lie with Young Women," *The Oregonian*, 30 November 1993, B5. William Raspberry is a syndicated columnist for the *Washington Post.*

21. Lawrence M. Mead, "Job Programs and Other Bromides," *New York Times* Op-Ed page, 19 May 1992, A19.

automatically believing everything the "good guys" say and rejecting everything the "bad guys" say. His message applies to journalists as well as scientists: "If public health and epidemiology want to avoid becoming a branch of politics rather than science, the key issues are methods and process, not the 'goodness' of the goals or investigators. In science more than law, the 'bad guy' . . . should always have the right to state his case, and a well stated case has the right to be heard, regardless of who pays for it."[22]

i. So how should we react when the Philip Morris and R. J. Reynolds tobacco companies embark on an advertising campaign to convince us that secondhand smoke is harmless? . . . Who's telling the truth? Put the question to a simple test: who benefits and how? The tobacco giants have demonstrated that their paramount interest is protecting their $45 billion industry, and that the addiction, disease and premature death caused by cigarettes are not factors that concern them.[23]

j. Books and magazines that use a vocabulary that deludes women into thinking themselves rebels and outlaws, on the cusp of some new freedom, misperceive our basic situation. A defect in the early thinking of the women's movement was a tendency to liberate women not for life but for life in the counterculture; when that life was over, many women found themselves in limbo. . . . If we wish to be firm-voiced and progressive about meeting our primary needs, we should not point our heads in the direction of the wrong revolution. Vague definitions such as sister, rebel and outlaw may be handy for magazines in search of a vast circulation, but are of no use to thinking adults. Sexual liberation without economic security grants women merely the right to stay marginal. Women must cease being conned into substituting fantasy sexual revolutions for political pressure or real reforms that would give us true equality.[24]

2. The following selections each contain arguments. Use the techniques of reconstruction discussed in this chapter to reconstruct one or two of the more important and interesting ones.

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22. Jacob Sullum, "Passive Reporting on Passive Smoke," *Forbes MediaCritic.* From the last of a four-part series of advertisements titled "How to Spot Flaws in Secondhand Smoke Stories."

23. Gerald Alfers, *Olympian* (Olympia, WA), 18 July 1994, A7. Gerald Alfers is a board member and former president of the American Lung Association of Washington. His column was in response to the advertisement from which the previous passage was taken.

24. Barbara Probst Solomon, "This Take-a-Lover Chatter Overlooks the Bottom Line," *International Herald Tribune,* 10 July 1992, 7.

a. *Lecture Fragment*

Plea bargaining (agreeing to plead guilty in exchange for a reduced sentence) generates problems. Innocent defendants who can't afford bail may plead guilty just to avoid jail time waiting for trial. The process makes no presumption of innocence. Guilt is not determined in an adversarial process, it is negotiated. It makes work easier for prosecutors, defense attorneys, and judges, but it sacrifices the interests of society.

Given these problems, some have suggested that plea bargaining be eliminated. But this might create an even worse problem. Ninety percent of defendants plead guilty, and most of those do plea-bargain.

Suppose plea bargaining were eliminated and the percentage of guilty pleas dropped to 80 percent. This would double the number of criminal trials, placing a staggering burden on the criminal justice system.

The experience of Alaska, however, calls this fear into question. Alaska has virtually done away with plea bargaining. There was some increase in the number of trials, but not as much as expected. In the year before elimination of plea bargaining, there were seventy-two felony trials in Fairbanks. In the year after, there were ninety. This is only a 25 percent increase.

Why was the increase so small? The explanation of why defendants plead guilty could be because most of them are factually guilty, and they don't have a viable legal argument for their defense (that is, they are legally guilty as well), so they believe it is unlikely they would win in a trial. If this is the case, then as Alaska's experience indicates, while it may be difficult to eliminate plea bargaining, it is not impossible.

**(Note: There are several arguments in this lecture fragment. After formulating your reconstructions, compare them to those made on pages 9–10. Remember that the reconstruction of arguments from longer passages allows for some degree of individual interpretation.)**

b.

**License Users of Guns, Just Like Drivers of Cars**
**Opposing view: Only the law-abiding will submit to such restrictions, thereby making crime easier**
*(By André Marrou, 1992 Libertarian Party presidential nominee)*[25]

If anti-gun laws worked, then New York and Washington, with the toughest anti-gun laws, would have the lowest crime rates. But they have the *highest.*

Conversely, crime rates plummeted up to 90% after certain cities and states—like Orlando, Fla., and Kennesaw, Ga.—allowed law-abiding citizens to carry concealed handguns.

The reason should be obvious: law-abiding citizens know and obey the law. Criminals don't care what the law is and won't obey it. So who benefits when gun ownership and use are restricted? The criminals, because decent folks are disarmed by the law, making it easier for criminals to prey upon them.

Registering guns and licensing gun owners won't reduce crime any more than registering cars and licensing drivers now reduce traffic accidents—which is to say, hardly at all. With millions of highly restrictive laws, still about 44,000 Americans yearly die in traffic accidents, while about 15,000 are shot to death. Since there are fewer cars than guns, cars are clearly more dangerous than guns. Should we outlaw cars?

Like cars, guns are dangerous tools. So are kitchen knives (ask John Bobbitt) and chain saws; should we register or outlaw them, or license their use? Just because something is dangerous—say climbing mountains or riding bulls—doesn't mean we should restrict its use or test and license its practitioners.

Guns are tools, not evil instruments capable of their own malevolence. A gun simply amplifies its user's power. In a rapist's hands, a gun is bad; in a law-abiding woman's hand, it's good. New York and Washington have proved that guns cannot be kept from criminal hands; shouldn't we let decent people arm themselves without licensing?

Ultimately, "gun control" is not about guns. It's about control. Beware.

25. The January 1, 1994, issue of *USA TODAY* contained an editorial titled "License Users of Guns, Just Like Drivers of Cars," which presented the position of the editorial staff. It defended the position that "as a matter of public safety and accountability, the states should require that all gun users be licensed." The André Marrou selection above presents an opposing view.

c.

**The First Amendment Unworthily Used**[26]

A lawyer for the B[r]ooklyn Museum of Art misappropriated a revered American concept in a hearing stemming from the museum's controversial art exhibit.

The laywer was protesting an order by New York City Mayor Rudolph Giuliani to deny the museum $7.2 million in city financing in retaliation for its showing of the exhibit, which included a portrait of the Virgin Mary partly composed of elephant feces and surrounded by pornographic cutouts. Catholic groups have called the portrait offensive.

Denial of the museum funds, the lawyer said, is a First Amendment catastrophe. He likened it to a book burning, the destruction of free expression. The First Amendment prohibits Congress from abridging the freedom of speech.

Certainly Giuliani's fund-withholding tactic leaves plenty of room for criticism. As has been said before in this space, the ideal relationship between the govern ment and the arts is a hands-off policy, even if the government is paying part of the bill. Otherwise, the result is to have elected officials or bureaucrats deciding what is or isn't art, an assignment that they are rarely qualified to carry out.

Of course, the arts professionals to whom the responsibility is delegated also have a responsibility to exercise judgment. More than once in recent years, people in such a position have seemed to let their judgment be guided mostly by considerations of what would shock and offend—stuff that, as has been noted in some cases, would constitute a hate crime if it were smeared on the wall of a church or synagogue instead of being hung in a museum.

Giuliani is entitled to criticize the exhibit. But the directors of the museum were hired to exercise judgment. Just because the mayor disagrees with their judgment is insufficient cause to nuke their funding for the year. His are the actions of a man who has lost perspective.

The same is true of the lawyer. The city has suppressed

26. Copyright 1999 by the *Omaha World-Herald*. Reprinted with permission.

nothing. No paintings have been banned or burned. No one has been barred by law from seeing the exhibit.

Indeed, it is widely predicted that the controversy has raised the potential market price of items in the display, some of which may be put up for sale when the run at the Brooklyn is finished.

The only question involved here is whether offensive art has an unquestioned entitlement to public subsidy. To make that a first Amendment question is a misrepresentation. The owner of the art is free to display it around the country and to assume he will have the backing of the courts if the government tries to stop him.

## Using Techniques of Reconstruction in Writing

Some of the same considerations that are relevant to understanding somebody else's argument also apply to presenting one yourself. After developing some ideas in a preliminary draft, you will be able to decide whether you want to present an argument in your essay, and if so, what that argument will be. Argumentative prose, even more than other kinds of writing, requires you to have a clear idea of what you want to say before you develop a final draft of your essay. Some skilled authors do not need to spend much time thinking out the structure of their argument. But if you find writing difficult, you will find it a good idea to write out or sketch in standard form any arguments you are advancing *after* writing a preliminary draft but *before* writing a final draft. As you become more proficient you will no longer need to work out the argument in detail, although even skilled writers find it helpful to do so when they weave complex arguments.

**Shaping Lean Prose** The techniques and exercises in this section are designed to help develop your ability to move from an argument in standard form back to a prose passage. In essence, you will be reversing the process of adding implicit premises and conclusions. Once you have clearly formulated an argument, including all premises needed to support the conclusion, you are free to attend to matters of style—in particular to economy, emphasis, and clarity of presentation. Four steps are useful in making this move from the more formal statement of argument in standard form to an actual passage.

1. Find and eliminate any premises that are obvious and uncontroversial.
2. Avoid unnecessary repetition of sentences or parts of sentences.

3. Place the parts of the argument you wish to emphasize at the beginning or (secondarily) at the end of the passage.[27]
4. Use examples if the argument contains concepts that are abstract or unfamiliar to your audience.

The first suggestion helps you focus the reader's attention on the more interesting parts of your argument—although, if your argument is weak, this move will only highlight its difficulties. The technique is sometimes misused in debate to cover up weaknesses in argument; that is, premises that cannot be adequately defended are left out in the hope that listeners will fail to see that the argument depends on these hidden assumptions. When used properly, however, such elimination can streamline your prose by preventing you from belaboring the obvious. You should also recognize the need to provide additional support for premises most vulnerable to disagreement. As an example, suppose you have created the following argument:

***Example 3.18***

*(1) Overconsumption of fat is hazardous to our health.*

*(2) We ought to avoid what is hazardous to our health.*

---

*∴ We ought to avoid overconsumption of fat.*

The second premise is unlikely to provoke much debate (though many people have difficulty living up to it). With this in mind, we can reformulate the argument and provide additional information.

> *Doctors have recently come to understand the influence of fat in the development of heart conditions. They have warned us that eating too much fat is hazardous to our health. Consequently, we ought to avoid such overconsumption.*

The second suggestion helps us shorten the prose presentation of our argument by eliminating redundant material. The most obvious application is to eliminate some of the repetitions created by if-then sentences, especially in cases in which the consequent of one sentence is the antecedent of the next. Often the repeated sentence can be replaced by saying, "If so, then . . ." or "If that is the case, then . . ." An argument can also be shortened by dropping some of the connective words such as the *either* in either-or sentences or the *then* in if-then sentences. Other steps might include obvious economies like shortening sentences; for instance, "Our desires have betrayed us and our illusions have betrayed us" can be trimmed to "Our desires and illusions have betrayed us."

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27. Cognitive psychologists have noted, for example, that in many contexts what is presented first and what is presented last in a series of items are best remembered. They call these the *primacy* and *recency* effects, respectively.

Numerous other devices to shorten and provide a more effective presentation of an argument can be employed as long as the basic meaning and connections in the passage remain clear. The amount of simplification that is appropriate depends in part on the stylistic level you seek in your writing. A more formal style will contain more connective words than a conversational style.

The third and fourth suggestions do not shorten your presentation of an argument, but they do make you more effective in conveying your meaning. People attend more strongly to the first and last sentences of a short passage than to the intervening sentences. In recognition of this fact (and perhaps as its cause), writers customarily fill these slots with the sentences they wish to emphasize. Sometimes the focus is on the conclusion; at other times the most controversial premise is placed at the beginning, where it serves to concentrate attention on what is most significant in the argument.

**Adding Illustrations** We can make our argument more accessible to readers by providing some concrete illustrations for concepts that are abstract or that might be misconstrued. These examples do not support our premises directly, but they make it easier to understand our argument. We can try our tactics on this sample:

***Example 3.19***

*(1) Americans are overly concerned with the pleasures of the moment.*

*(2) If Americans are overly concerned with the pleasures of the moment, then they are unlikely to sacrifice private gain for public projects.*

*(3) If Americans are unlikely to sacrifice private gain for public projects, then America will fail to solve the social and economic problems it will face in the future.*

---

*∴ America will fail to solve the social and economic problems it will face in the future.*

By removing the repetition of elements in the if-then sentences and focusing on the conclusion, we can obtain a paragraph that reflects this argument.

***Presentation 1***

*The prospects for America look bleak. It will fail to solve the social and economic problems it is bound to face in the future because Americans are unwilling to make sacrifices for the sake of the country. This is just another manifestation of a growing phenomenon: devotion to immediate pleasures at the expense of public concerns.*

A second version can be created that focuses on the first premise and illustrates the phrase *concerned with the pleasures of the moment* with concrete examples.

***Presentation 2***

*Devotion to immediate pleasures will have dire consequences for America. The country will not mount an adequate attack on the multitude of social problems it faces because it is unable to make the sacrifices their solution requires. Effective social action will have widespread public support only if Americans are prepared to look*

*beyond their own lives and feel themselves fully a part of the larger community. The allure of drug-induced experiences and the self-indulgence of fancy automobiles make such a social vision impossible.*

## Exercise 3.4 Moving from Arguments in Standard Form to Prose Passages

Transform each of the following arguments in standard form into a short prose passage that adequately reflects the basic thrust of the argument without use of extraneous material.

1. *(1) If capital punishment is justified through its deterrent effect, then the killing of an innocent person as a scapegoat is sometimes justified.*

   *(2) The killing of an innocent person as a scapegoat is never justified.*

   *∴ Capital punishment is not justified through its deterrent effect.*

2. *(1) If a drunken driver kills a person, then he has unintentionally taken the life of a person in circumstances he could reasonably foresee.*

   *(2) If a person unintentionally takes the life of another in circumstances he could reasonably foresee, then he has committed either second degree murder or is guilty of criminal negligence.*

   *∴ If a drunken driver kills a person, then he has committed either second degree murder or is guilty of criminal negligence.*

3. *(1) If Darwin's theory of evolution is correct, then every animal is adapted to its particular biological niche.*

   *(2) If every animal is adapted to its particular biological niche, then large-scale environmental change will radically affect most animals.*

   *∴ If Darwin's theory of evolution is correct, then large-scale environmental change will radically affect most animals.*

4. *(1) If Americans overconsume now, then they borrow against the future.*

   *(2) If Americans borrow against the future, then they leave their children in an untenable position.*

*(3) If Americans leave their children in an untenable position, then they have failed their children.*

---

*∴ If Americans overconsume now, then they have failed their children.*

CHAPTER FOUR

# *Evaluating Arguments: Some Basic Questions*

This chapter will focus on two questions we must ask when we evaluate an argument:

1. Does the conclusion follow from the premises?
2. Should the premises be accepted as true?

If the conclusion does follow and the premises are true, then we call an argument sound. Corresponding to these two criteria of soundness are two ways of criticizing an argument: showing that the conclusion does not follow and showing that the premises are doubtful (Table 4.1).

**Table 4.1**

| *Criteria for Soundness* | *Corresponding Criticisms* |
|---|---|
| 1. Conclusion follows from premises | 1. Show that conclusion doesn't follow from the premises |
| 2. Premises are true | 2. Show that premises are doubtful |

Before we explore these two features that we look for in a good argument and the corresponding criticisms we can make of bad arguments, it will be helpful to explain the difference between them. Obviously, Examples 4.1 and 4.2 are both

faulty arguments, but what is wrong with 4.1 is wholly different from what is wrong with 4.2.

***Example 4.1***

*(1) If AIDS is harmless, then we need not take precautions against it.*

*(2) AIDS is harmless.*

*∴ We need not take precautions against AIDS.*

**Conclusion follows but premise 2 is false**

***Example 4.2***

*(1) Any disease that threatens many lives is worth our concern.*

*(2) Mumps is worth our concern.*

*∴ Mumps is a disease that threatens many lives.*

**Premises are true but conclusion does not follow**

When we say that the conclusion does not follow from the premises, as in Example 4.2, we are saying that something is wrong with the *form* or *pattern* of the argument. On the other hand, when we say that a premise is not acceptable, as in Example 4.1, it is the content, not the pattern of the argument, that we are criticizing.

Think of an argument as like a building, with the premises being the foundation, the conclusion being the house that it supports, and the form or pattern of the argument being the design of the building. The design could be a perfectly good one, but if the foundation is made of weak material the house could collapse. Similarly, an argument could fit a correct pattern, but if the premises are false, the conclusion could be false as well. On the other hand, the foundation could be perfectly strong, but if the design is faulty, the house might collapse in this case too because of this poor design. Analogously, an argument could have true premises but an incorrect pattern, in which case the conclusion could be false. Example 4.1 is like a building with a good design but a faulty foundation. The pattern is *modus ponens* from our list of common successful patterns, but the second premise—*AIDS is harmless*—is obviously false. Example 4.2 is like a building with a strong foundation (true premises) but a bad design.

***Pattern of Example 4.2 (Faulty Argument)***

*(1) All $P_1$'s are $P_2$'s.*

*(2) $m$ is a $P_2$.*

*∴ $m$ is a $P_1$.*

The following section will explain some ways of showing that for any argument with this pattern, the conclusion does not follow from the premises.

In contrast to Examples 4.1 and 4.2, we judge Example 4.3 to be a successful argument. Note that it exhibits one of the common successful patterns from

our list. In addition it has true premises. Logicians call this property *soundness*: having true premises and a conclusion that follows from them (a good foundation and a good structural fit).

***Example 4.3*** ***Sound argument: True premises and the conclusion follows***

*(1) Any disease that threatens many lives is worth our concern.*

*(2) AIDS threatens many lives.*

---

*∴ AIDS is worth our concern.*

Again, an argument's conclusion follows from its premises because of the form, or pattern, of the argument. The technical term for this property of having a correct pattern so that the conclusion does follow is *validity*. Table 4.2 displays these properties and the technical terms that philosophers use to characterize them.

**Table 4.2**

| *Property* | *Term for Property* | |
|---|---|---|
| 1. Good design | Validity | |
| 2. Solid foundation | Truth of premises | Soundness |

In the following section, we discuss in greater detail what it means for the conclusion to follow from the premises and offer some techniques for showing that the conclusion does not follow. This topic of how to determine the validity or invalidity of an argument is treated more formally in the next (optional) chapter of the book.

## When Does the Conclusion Follow from the Premises?

In chapter 2 we presented a chart of seven argument patterns. A portion of this chart is repeated below. We claimed that, for any argument that fits one of these patterns, its conclusion follows from its premise.

**Some Common Successful Argument Patterns**

**i. *Modus Ponens***

*(1) If A, then B.*
*(2) A.*
*∴ B.*

**ii. *Disjunctive Argument***

*(1) Either A or B.*
*(2) Not A.*
*∴ B.*

**iii. *Modus Tollens***

*(1) If A, then B.*
*(2) Not B.*
*∴ Not A.*

**iv. *Hypothetical Argument***

*(1) If A, then B.*
*(2) If B, then C.*
*∴ If A, then C.*

**v. *Chain Argument***

*(1) A.*
*(2) If A, then B*
*(3) If B, then C.*
*∴ C.*

**vi. *Predicate Instantiation***

*(1) All $P_1$'s are $P_2$'s.*
*(2) m is a $P_1$.*
*∴ m is a $P_2$.*

**vii. *Universal Syllogism***

*(1) All $P_1$'s are $P_2$'s.*
*(2) All $P_2$'s are $P_3$'s.*
*∴ All $P_1$'s are $P_3$'s.*

What do we mean when we say that the conclusion of an argument follows from its premises? A less metaphorical way of putting it is that if the premises are true, then the conclusion must necessarily be true. In other words, it is impossible for the premises to be true and the conclusion false. We will try to make this clearer by contrasting several of the successful patterns from the chart with unsuccessful ones—patterns that would permit the possibility that the premises could be true but the conclusion false. At the same time, we will illustrate two techniques of showing that a conclusion doesn't follow from the premises. Two sentence-based patterns from the chart, *modus ponens* and *modus tollens*, were contrasted to unsuccessful patterns in chapter 2. Here we will examine the predicate-based patterns.

***Example 4.4***

| ***Successful Pattern*** | ***Contrasting Unsuccessful Pattern*** |
|---|---|
| **vii. *Universal Syllogism*** | |
| *(1) All $P_1$'s are $P_2$'s.* | *(1) All $P_1$'s are $P_2$'s.* |
| *(2) All $P_2$'s are $P_3$'s.* | *(2) All $P_2$'s are $P_3$'s.* |
| *∴ All $P_1$'s are $P_3$'s.* | *∴ All $P_3$'s are $P_1$'s.* |

For any argument that fits the pattern on the left, if the premises are true, then the conclusion must be true. An argument could fit the pattern on the right, however, and have true premises and a false conclusion. Here is an example of each kind of argument.

***Example 4.5***

| ***Argument A*** | ***Argument B (Faulty)*** |
|---|---|
| *(1) All good teachers treat students with respect.* | *(1) All good teachers treat students with respect.* |
| *(2) All who treat students with respect listen to what students say.* | *(2) All who treat students with respect listen to what students say.* |
| *∴ All good teachers listen to what students say.* | *∴ All who listen to what students say are good teachers.* |

When we say that the conclusion of argument A follows from its premises (that is, that the argument is valid), we are making a universal claim about all arguments that fit this same pattern. We are saying that the pattern is such that it will always take us from true premises to a true conclusion. Make up any argument you like. As long as the premises are true and they fit the pattern:

*(1) All $P_1$'s are $P_2$'s.*

*(2) All $P_2$'s are $P_3$'s.*

then the conclusion, *All $P_1$'s are $P_3$'s*, will be true also. For example, it is true that *all cats are mammals* and *all mammals are animals*. Since these premises fit the stated pattern, it follows that *all cats are animals*.

**The Counterexample Method of Showing That an Argument's Conclusion Does Not Follow** Since the claim that an argument's conclusion follows from its premises is universal (it applies to *all* cases having the same pattern), we can identify one way of showing that an argument's conclusion does not follow—that is, give a counterexample to this general claim.[1] The general claim (which is implicit any time we advance an argument) is: *all arguments that fit this same pattern and have true premises will have a true conclusion*. A counterexample to this claim, then, is an argument that *fits the same pattern*, has (obviously) *true premises*, and has an (obviously) *false conclusion*.

1. The counterexample method of showing that an argument pattern is invalid should not be confused with the counterexample method of showing that a universal premise is false. The latter is explained on page 103.

Suppose someone actually advanced Example 4.5, argument B:

*(1) All good teachers treat students with respect.*

*(2) All who treat students with respect listen to what students say.*

*∴ All who listen to what students say are good teachers.*

The person who advances this argument, in believing that the conclusion follows from the premises, is implicitly committed to the belief that if any other argument fits this same pattern, its conclusion will also follow from its premises. To give a counterexample, then, we could say: "That's just like arguing: *'All cats are mammals, and all mammals are animals, so all animals are cats'!"* This argument fits the same pattern as argument B and the premises are obviously true, but the conclusion is obviously false.

**Method 1: Find a Counterexample**

To show that the conclusion of an argument does not follow from the premises, you should:

1. Determine the pattern of the argument you wish to criticize,
2. Make up a new argument, with
   a. the same pattern,
   b. obviously true premises, and
   c. an obviously false conclusion.

We say "obviously true" premise and "obviously false" conclusion because you want to make it as clear as possible to the arguer (and to yourself) that the pattern in question can take you from true premises to a false conclusion. It is a good idea to use simple, familiar objects and relationships in your counterexample, as we did in the argument about cats, mammals, and animals.

This counterexample method is the main one we recommend for criticizing the structure of arguments in ordinary discourse. Even this simple method requires an audience willing to listen patiently and thoughtfully to understand your point. More sophisticated techniques might not be readily understood except by those already schooled in logic. For a general audience, you might have even avoided referring to arguments with correct patterns as valid, because this technical logician's term could be misleading. Since many people would think of a valid argument as completely successful, not just formally correct, it would be confusing to them to hear an argument referred to as valid if it had obviously false premises.

The other predicate-based pattern on our list can also be contrasted to a similar but unsuccessful version:

***Example 4.6***

| ***Successful Pattern*** | ***Contrasting Unsuccessful Pattern*** |
|---|---|
| **vi. *Predicate Instantiation*** | |
| *(1) All $P_1$'s are $P_2$'s.* | *(1) All $P_1$'s are $P_2$'s.* |
| *(2) m is a $P_1$.* | *(2) m is a $P_2$.* |
| *∴ m is a $P_2$.* | *∴ m is a $P_1$.* |

Because argument A, below, fits the successful pattern, its conclusion follows from its premises, while for argument B (which fits the unsuccessful pattern), the conclusion does not follow.

***Example 4.7***

| ***Argument A*** | ***Argument B (Faulty)*** |
|---|---|
| *(1) All good athletes are well coordinated.* | *(1) All good athletes are well coordinated.* |
| *(2) Carlos is a good athlete.* | *(2) Carlos is well coordinated.* |
| *∴ Carlos is well coordinated.* | *∴ Carlos is a good athlete.* |

Because of its successful pattern, it is impossible for the premises of argument A to be true and its conclusion to be false. This is not to say that the argument's premises or its conclusion are in fact true—Carlos could be a terrible athlete and poorly coordinated. But as long as the premises *are true*, the conclusion will be true also. Furthermore, for any other argument that fits this pattern, if it has true premises, it will also have a true conclusion. In this section, we do not discuss techniques for showing that an argument has a successful pattern (this is done in chapter 5), but a few moments' thought should assure you that the pattern of argument A in Example 4.7 will always take you from true premises to a true conclusion. The first premise asserts that one class of things is contained in a second class of things. The second premise locates a certain individual in the first class. Now if this first class is contained in the second class of things, the individual (Carlos in this case) can't be in the first class without being in the second class. What the argument asserts is true no matter what classes and what individuals we are discussing. A second example of this successful pattern would be:

***Argument with Same Pattern as Example 4.7A***

***Argument A***

*All U.S. presidents have been U.S. citizens.*

*Carter has been a U.S. president.*

*∴ Carter has been a U.S. citizen.*

Using these same familiar relationships, we can construct a counterexample to show that the conclusion of argument B does not follow from its premises:

***Counter-example to Example 4.7B***

***Argument B***

*(1) All U.S. presidents have been U.S. citizens.*

*(2) I have been a U.S. citizen.*

*∴ I have been a U.S. president.*

Since this argument has true premises and a false conclusion and fits the same pattern as argument B, the pattern of argument B is not successful: argument B's conclusion does not follow from its premises.

**A Second Method of Showing That an Argument's Conclusion Does Not Follow** Although this counterexample method is often the easiest way to show that a conclusion doesn't follow, a second method is sometimes easier yet: we can simply explain how it would be possible for the premises of an argument to be true but the conclusion false. This doesn't involve making up a new argument, just discussing the argument at hand. Again, we can use argument B as an example:

***Example 4.7B***

***Argument B***

*All good athletes are well coordinated.*

*Carlos is well coordinated.*

*∴ Carlos is a good athlete.*

The following passage describes a possible situation in which the premises of argument B are true and the conclusion is false:

> *Suppose it is true that all good athletes are well coordinated and that Carlos has excellent coordination. But suppose also that Carlos is extremely slow, in bad physical condition, and has never practiced any athletic endeavors.*

Here we have a situation in which the premises of argument B would be true but the conclusion is false. But what it means for the conclusion of an argument to follow from the premises is that it is impossible for the premises to be true and the conclusion false. Hence, we have shown that the conclusion of argument B does not follow from the premises.

**Method 2: Describe an Invalidating Possible Situation**

To show that the conclusion of an argument *does not follow* from the premises, you should:

Describe a possible situation in which the premises are obviously true and the conclusion is obviously false.

Consider the following argument:

***Example 4.8*** ***Argument to Be Evaluated***

*(1) If alcohol consumption is declining, then drunken driving is declining.*

*(2) If drunken driving is declining, then the auto accident rate is declining.*

*(3) The auto accident rate is declining.*

---

*∴ Alcohol consumption is declining.*

This argument has the pattern:[2]

*(1) If A, then B.*

*(2) If B, then C.*

*(3) C.*

---

*∴ A.*

We can see this is an invalid argument by using either of the two methods described above. By method 1, we can construct a counterexample.

***Example 4.9*** ***Counterexample***

*(1) If the White House is in Cleveland, then it is in Ohio.*

*(2) If the White House is in Ohio, then it is in the United States.*

*(3) The White House is in the United States.*

---

*∴ The White House is in Cleveland.*

2. This might be mistaken for the valid argument form
   *(1) If A, then B.*
   *(2) If B, then C.*
   *(3) A.*
   ---
   *∴ C.*
which is a variant of pattern (v) on our chart.

All three of the premises are true. If any building is in Cleveland, then it is in Ohio. If a building is in Ohio, then it is in the United States. Finally, the White House is in the United States. But of course, it is in Washington, D.C., not in Cleveland, Ohio. This counterexample shows that the original argument does not reflect a valid argument form.

Method 2 leads us to describe a situation in which the argument to be evaluated has true premises and a false conclusion. Suppose that highways are improved or the proportion of young male drivers declines. Each of these could produce a decrease in the accident rate, even though the amount of alcohol consumption does not decline. In such a case all the premises could be true and the conclusion false.

Both these methods focus on showing that it is possible for all the premises to be true and the conclusion false. When a deductive argument is valid, it is *impossible* for this to occur. This logical impossibility is due to the form or pattern of the argument. We discuss logical impossibility at greater length in chapter 5. For now, a few physical analogies should help introduce the concept.

> An argument is valid just in case there is no possible situation in which all of its premises are true and its conclusion is false.

**Depicting Validity** An analogy with physical impossibility is useful in clarifying the concept of validity for statement-based arguments. As shown below, we can model the valid chain argument by representing premises 1 and 2 as an arrangement of blocks or dominoes set up close to each other. If the first is pushed, then the others fall in turn, until the last (C) falls as well. In this model, it is impossible to push A without C falling, given how the blocks are related to each other. The same is true for the "logical" links created by the if-then statements. If A is true, then C must be as well.

***Valid Argument Pattern***

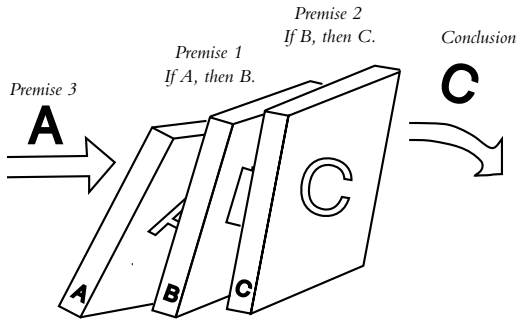
*(1) If A, then B.*

*(2) If B, then C.*

*(3) A.*

---

∴ C.




Contrast this relation with that of the invalid argument actually found in the example:

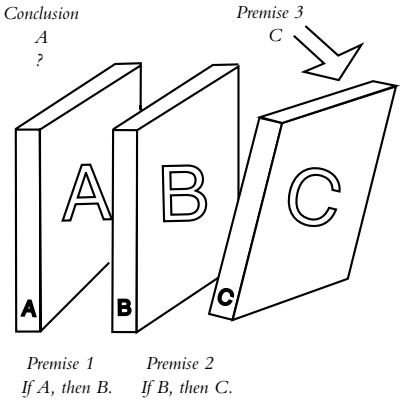
***Invalid Argument Pattern***

*(1) If A, then B.*

*(2) If B, then C.*

*(3) C.*

*∴ A.*

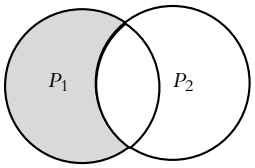



In this case, pushing block C doesn't force A to fall, even though A is next to B and B is next to C. Similarly, as the application of the two methods shows, it is logically possible for the premises to be true and the conclusion false.

Another way of depicting validity is used for predicate-based arguments. Simple forms of these arguments can be represented using Venn diagrams.[3] Consider the following valid "predicate-based" argument from Example 4.7A.

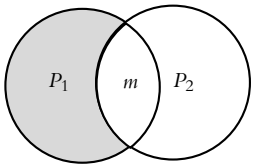
| ***Argument: Example 4.7A*** | ***Pattern: Predicate Instantiation*** |
|---|---|
| *(1) All good athletes are well coordinated.* | *(1) All $P_1$'s are $P_2$'s.* |
| *(2) Carlos is a good athlete.* | *(2) m is a $P_1$.* |
| *∴ Carlos is well coordinated.* | *∴ m is a $P_2$.* |

Unlike statement-based arguments, which depend on the relationship of statements joined by connecting words such as *if-then* and *either-or*, predicate-based arguments depend on the internal structure of statements. We can illustrate the structure of a statement like *All good athletes are well coordinated*—which exhibits the pattern "All $P_1$'s are $P_2$'s"—using the following Venn diagram:




3. Named after British logician John Venn (1834–1923), who developed this method of presenting relationships.

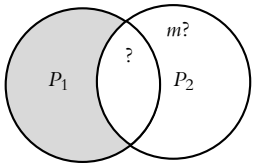
The left-hand circle represents the class of $P_1$'s (in this case, good athletes), and the right-hand circle represents the class of $P_2$'s (in this case, the well coordinated). By shading the part of the $P_1$'s circle that doesn't overlap the $P_2$'s circle, we are indicating that this part of the circle is *empty*—that all $P_1$'s are $P_2$'s. Now if we place an *m* in the unshaded part of the $P_1$'s circle, indicating that *m* is a $P_1$ (in our argument, Carlos is a good athlete), we see that *m must* lie within the $P_2$'s circle, which is our conclusion—*m* is a $P_2$ (Carlos is well coordinated) according to pattern (vi) for Predicate Instantiation.




By contrast consider the invalid argument from Example 4.7B.

| ***Argument: Example 4.7B*** | ***Faulty Argument Pattern*** |
|---|---|
| *(1) All good athletes are well coordinated.* | *(1) All $P_1$'s are $P_2$'s.* |
| *(2) Carlos is well coordinated.* | *(2) m is a $P_2$.* |
| *∴ Carlos is a good athlete.* | *∴ m is a $P_1$.* |

We can represent a possible counterexample using the same circles and shading as before for the first premise, but this time we are not assured of the truth of the conclusion. As shown below, one possible way in which the second premise could be true is represented by the *m?* in the $P_2$ circle (indicating that Carlos is well coordinated). In this case, the conclusion is false because *m* is not in the $P_1$ class (i.e., Carlos is not a good athlete).[4]




4. Of course, *m* could also be in the intersection of $P_1$ and $P_2$ as represented by the *?*. But it *need not* be. If an argument is valid, then there is no possibility that the premises are all true and the conclusion is false. This Venn diagram depicts just such a situation. So the argument is invalid. Chapter 5 contains further discussion of Venn diagrams as a method of testing the validity of simple predicate-based argument patterns.

**How Often Do We Need to Show That an Argument's Conclusion Doesn't Follow?** It is actually rare in everyday discourse to encounter an argument whose conclusion *clearly* doesn't follow from its premises. This is partly because it is rare for all the premises and the conclusion of an argument to be explicitly stated. If we make a charitable interpretation of what has been said or written, we can almost always reconstruct an argument so that its conclusion follows. However, it is still important to understand the concept of validity and to be able to explain to yourself why the conclusions of some arguments don't follow from the premises. In fact, whenever you reconstruct an argument with missing parts, you must think about correct structure as you attempt to make the argument fit a successful pattern. We might say that the criterion that the conclusion must follow from the premises is used primarily in *self-evaluating* your reconstruction of an argument rather than in expressing a criticism of someone else's argument.

Notice that this section gives you some techniques for showing that an argument's conclusion *doesn't* follow, but no techniques for showing that a conclusion *does* follow. As we have said, in most cases when you reconstruct an argument you will either make it follow one of the seven successful patterns or a pattern that is such a simple variation or combination of these patterns that you can readily see that it is successful. Another reason is that the techniques for showing that a conclusion does follow require considerable explanation and some introduction of formal symbols, as we indicate in (optional) chapter 5.

## Exercise 4.1 Showing Invalidity

Show that each of the following arguments is invalid (that is, the conclusion doesn't follow from the premises). Use either the counterexample method or the possible situation method. Explain what you are doing clearly enough that an intelligent general audience would understand the point you are making.

1. Anyone who lives with a smoker has an above-average risk of heart disease. Sarah doesn't live with a smoker. So Sarah doesn't have an above-average risk of heart disease.
2. If police departments improve their effectiveness, crime rates go down. Crime rates have gone down. So police departments have improved their effectiveness.
3. If dinner guests are coming, then we need more food. If we need more food, then we need to go to the store. Dinner guests aren't coming. Therefore, we don't need to go to the store.
4. No great singer has a weak voice. Kim is not a great singer. It follows that Kim has a weak voice.

5. If the American people feel overtaxed, then they will press for tax cuts. The American people don't feel overtaxed. So they won't press for tax cuts.
6. All doctors have studied medicine. Paul is not a doctor. Therefore, Paul has not studied medicine.
7. All compassionate people are honest people. This is so because all good friends are compassionate people, and all good friends are honest people.
8. The Internet is the business opportunity of the future. This is so because stocks in technology will be strong. If the Internet is the business opportunity of the future, then it will attract more investment. If it will attract more investment, then stocks in technology will be strong.
9. Anyone who is good at science is good at math. Anyone who is good at math is intelligent. So, anyone who is intelligent is good at science.
10. Either we will ration health care, or we will spend too much on health care. We will ration health care. So we won't spend too much on health care. **(Hint: To call this argument invalid is to take the word *or* in the inclusive sense of "either A or B or both." A counterexample would need to be an argument of the same pattern that clearly used *or* in this inclusive sense.)**

## When Should the Premises Be Accepted As True?

As we have seen, an argument's conclusion can follow from its premises, even though some or all of the premises are false.

***Example 4.10***

*(1) If an effective cure for AIDS is available, the government should provide it to all who need it but can't afford it.*
*(2) An effective cure for AIDS is available.*

*∴ The government should provide it to all who need it but can't afford it.*

Unfortunately, although this argument is valid (that is, its conclusion follows), the second premise is false. (At least we take it to be false at the time of the writing of this book.) Because the second premise is false, the argument is not sound; it doesn't justify our belief in the conclusion.

In general, the question of whether an argument's conclusion follows can be answered with greater certainty than the question of whether its premises are true. Logicians have developed techniques that can tell us whether an argument is correctly structured, even when we are dealing with much more complex arguments than those illustrated on our list of patterns. By contrast, there is no general method of determining whether premises are true or false.

Most of the arguments we encounter in our everyday lives have premises whose truth or falsity cannot be determined with certainty. Consider our *judgment* that the argument about an AIDS cure (Example 4.10) is *unsound* because the premise *An effective cure for AIDS is available* is *false*. We are not as certain about this judgment of falsity as we would be if an argument contained statements from arithmetic. We can only give reasons why it is highly unlikely that an AIDS cure is available. For example, we can point out that this would be such important news that we surely would have heard about it, and that it would be difficult to suppress news of the discovery of an AIDS cure.

We use reasons such as these to justify our j*udgment* that the premise *A cure for AIDS is available* is false even though we are not absolutely certain that it is false. And we use comparable reasons for making judgments that some premises of arguments are true. Sometimes we are relatively certain about premises because of clear, direct observations we have made (for example, that a friend has acted aggressively) or because we have evidence from many independent sources (for instance, that the U.S. balance of trade is unfavorable). But at other times, we must decide whether to accept the premises of an argument when we are not all that certain of their truth or falsity.

Most of the examples and exercises in the remainder of the book are not ones in which you will be led to a clear, definite decision: "This argument is sound." You will sometimes be able to determine with absolute certainty that an argument is *unsound* because it is *invalid*—that is, the conclusion doesn't follow. But typically, you will be reconstructing the arguments you read in a way that makes them valid. Then the question remains of whether you should accept the premises as true. Answering this will be an exercise in using the background information and beliefs you already possess to give reasons for or against accepting premises.

Even though there is no general methodology for determining whether premises should be accepted as true, there are techniques that can be quite successful for criticizing certain broad categories of premises. Some of these are described in the following section.

**Tips on Casting Doubt on Premises** Since any kind of statement can serve as a premise in an argument, the question of how to cast doubt on premises is obviously too broad to be dealt with here in detail. How can you cast doubt on any statement? We have to assume that this is the sort of thing you already know how to do. We can, however, provide some techniques for attacking certain kinds of premises, as well as advice concerning which kinds of premises can be criticized most easily and fruitfully. The techniques we introduce in this section are: (1) giving counterexamples to premises that generalize, (2) breaking the connection in if-then premises, and (3) scrutinizing further implications of premises.

Perhaps the most straightforward criticism of a premise is a counterexample to a universal generalization.[5] If a premise claims that *All $P_1$'s are $P_2$'s*, or that *No $P_1$'s are $P_2$'s*—*All lying is wrong*; *No sea animals are mammals*—try to think of a clear counterexample (lying to save an innocent person's life; whales or seals). Some universal generalizations are true, but many can be shown to be false by pointing out that something is clearly a $P_1$ but is clearly not a $P_2$. Or, if the claim is that *No $P_1$'s are $P_2$'s*, point to something that is *clearly* a $P_1$ and is clearly also a $P_2$. When we say "clearly," we mean that it should be uncontroversial to your audience that your counterexample really is a counterexample. Some additional examples will show why this is important.

Suppose someone is arguing that all abortion should be illegal, and this person uses the premise *All killing of human beings is wrong*. You want to present as a counterexample something that is clearly a case of killing but that is clearly not wrong. To state that executing a murderer is not wrong would not be as effective for most audiences as to use the counterexample of killing another person in self-defense. This is because capital punishment is a controversial issue, and your audience might believe that executing a murderer is wrong. Then you would be sidetracked into debating this second issue. It is much less likely that your audience would believe that killing in self-defense is wrong, particularly if you described a situation in which killing the assailant was the only alternative to being killed. Obviously, the worst kind of attempted counterexample in this context would be to claim that killing a fetus is not wrong, since the issue being discussed is abortion and the arguer, presumably, believes that killing a fetus is wrong.

Consider the universal generalization: Any practice that is harmful should be illegal. Contrast the clear counterexamples below to the controversial or "borderline" counterexamples.

**Any practice that is harmful should be illegal.**

| ***Good Counterexample*** | ***Controversial, Borderline Counterexample*** |
|---|---|
| Neglecting to exercise | Hang gliding |
| Eating many doughnuts | Russian roulette |

Neglecting to exercise and eating many doughnuts are practices that are somewhat harmful to health, but surely they should not be illegal. The borderline cases

5. A universal statement applies to every case (in the "universe" under discussion). In this case it says that everything has a characteristic *(All $P_1$'s are $P_2$'s)* or everything does not have the characteristic *(No $P_1$'s are $P_2$'s)*.

are more controversial. Hang gliding and Russian roulette are clearly harmful, but some would claim that they should be illegal as well.

A second broad category of premise that can be challenged in a fairly straightforward way is an *if-then* premise, which claims a connection between two things. If the premise is of this type, try to think of ways the first thing could occur without the second occurring. For example, consider the premise *If birthrates continue to increase, then the world will become overcrowded*. What if death rates increase more rapidly than birthrates? What if people start colonizing other planets?

This kind of criticism is weaker than a clear counterexample to a universal generalization. Raising the possibility that the "if" part won't be followed by the "then" part doesn't show that the premise is false, just that it is less than certain. The more likely the event that would break the if-then connection, the less likely the premise.

A third kind of criticism can be attempted against any premise. That is, every premise has *further implications*—statements that *would* be true if the premise in question were true. Try to think of such implications, particularly ones that are highly doubtful. For example, someone might use as a premise the claim that punishment does not deter crime. This implies that if there were no punishment, there would still be no more crime than there is now. Do you believe this? For example, would you personally still refrain from stealing to the same extent that you do now, even if you knew you wouldn't be punished? Would you still pay your income taxes?

**Some Ways to Cast Doubt on Premises**

1. Counterexample for a universal generalization
2. Finding a clear case in which antecedent is true, consequent false for an if-then premise
3. For any premise, point out further implications that are doubtful

In general, after you have determined whether an argument's conclusion follows from its premises, you will want to survey the premises to decide where to begin your evaluation. As a general strategy, we suggest initially directing your attention to premises that can be discussed on the basis of generally shared background information. This is certainly preferable to quibbling over matters that require research and documentation that can't actually be carried out on the occasion of the discussion. Then, if you determine that your appraisal of the argument really hinges on specific facts that need to be researched, you can do the necessary investigation.

Much of the material in the following chapters will help you criticize more specialized kinds of premises. Chapter 6, on fallacies, will identify some specific

kinds of premises that are typically doubtful. Chapter 7 will help you evaluate definition-like premises. Premises that make statistical generalizations based on observational data will be scrutinized in chapter 8. Sometimes, elements of scientific theories are used as premises. Techniques for evaluating such premises are discussed in chapter 9.

## Exercise 4.2 Casting Doubt on Premises

Each of the following statements might occur as a premise in an argument. (Indeed, some of them are used as premises in the arguments in Exercise 4.4.) For each statement, think about what you might say to persuade someone that the claim being made is not true—or at least that it is doubtful. If you need more information about a topic, do a little research, either by consulting a source or by talking with someone you consider knowledgeable about the subject. Then put your ideas into writing, formulating a short paragraph casting doubt on each statement. Keep in mind the tips for casting doubt on universal claims and on if-then claims. If you find yourself initially inclined to agree with a statement, try to imagine what an intelligent critic on the other side of the issue might say to cast doubt on it.

1. If capital punishment is completely abolished, then the homicide rate will increase rapidly.
2. People shouldn't make promises unless they are certain they can keep them.
3. Any activity that makes people aggressive should be discouraged.
4. If the fetus is connected to a pregnant woman's body, then it is part of the woman's body.
5. Any activity that poses a risk to the health of bystanders violates their rights.
6. If two people aren't compatible, then they can't live together.
7. No person should pay taxes to support parts of government that that person doesn't use.
8. If abortion continues to be legal, then respect for life will decline.
9. If Asian and European countries continue to score much higher on international science and math exams, then the United States should adopt their educational methods.
10. All material that arouses lewd desires is pornographic.

## Sample Appraisals: Examples of Techniques of Criticism

As we have learned in the previous sections, an argument can be criticized by (1) showing that the conclusion doesn't follow or (2) showing that one or more premises should not be accepted as true. It is best to determine first whether the conclusion follows. In the process of making this determination, you will typically try adding one or more implicit premises to make the conclusion follow. Having done this, you will have a complete list of the premises you can challenge as you move to the second criticism. If it turns out that there is no plausible way of making the argument valid, then you need not waste your time evaluating the premises, since the faulty pattern will make the argument unsound even if the premises are true. This sequence of criticism is illustrated in the sample appraisal of the arguments in Examples 4.11 and 4.12, as well as in some additional comments on the relation between the two types of criticisms.

***Example 4.11***

*(1) John has withheld information.*

*(2) Withholding information is lying.*

*(3) Anyone who has lied has done something wrong.*

---

*∴ John has done something wrong.*

***Example 4.12***

*(1) It is wrong for any person to kill another person.*

*(2) If the state executes a murderer, then the state is killing a person.*

---

*∴ It is wrong for the state to execute a murderer.*

The initial question concerning either argument, then, is whether the conclusion follows from the premises. Even though the argument in Example 4.11 doesn't exactly fit one of our seven patterns, we can see fairly readily that it is valid. The first two premises—*John withheld information* and *Withholding information is lying*—amount to the claim that John has lied. If we add this to premise 3, we have an argument of the same type as pattern (vi) or Predicate Instantiation, in our list:

*(1) All $P_1$'s are $P_2$'s.*

*(2) m is a $P_1$.*

---

*∴ m is a $P_2$.*

That is,

*(1) All who have lied have done something wrong.*

*(2) John has lied.*

---

*∴ John has done something wrong.*

So the conclusion does follow. To admit this is not to admit that the premises are true; but if they are true, then the conclusion must be true as well.

But in the second argument (Example 4.12), there is no such relation between premises and conclusion. Even if it is wrong for any person to kill another person, and granting that the state, by executing a murderer, is killing a person, it doesn't follow that it is wrong for the state to execute a murderer because the state is not a person. There may be special considerations that justify killing by the state. So the second argument can be criticized as invalid.

The second kind of criticism (casting doubt on premises) can be raised against either argument. But before we discuss specific criticisms of premises, we should make some general points about the relation between the two kinds of criticisms. First, as we can see in Example 4.11, if the conclusion of an argument follows, then the only means of criticism left is an attack on the premises. If you decide that there are adequate grounds for believing the premises, then you should be compelled by these reasons to believe the conclusion. If it is impossible for the premises to be true and the conclusion false, and you believe the premises, then it is irrational not to believe the conclusion. Second, if an argument is invalid, then it is not necessary to criticize the premises. You can point out that it does not matter whether the premises are true or not—even if they are true, the conclusion still does not follow.

There is a fairly obvious move, however, that might be made in defense of an argument that has been called invalid: this is to claim that there are implicit premises that, if added, will make the argument valid. In the case of Example 4.12,

***Example 4.12 Repeated***

*(1) It is wrong for any person to kill another person.*

*(2) If the state executes a murderer, then the state is killing a person.*

---

*∴ It is wrong for the state to execute a murderer.*

it might be claimed that the argument should be expanded by the addition of an implicit premise.

***Example 4.12 with Implicit Premise Added (implicit)***

*(1) It is wrong for any person to kill another person.*

*(2) If the state executes a murderer, then the state is killing a person.*

*(3) Everything that is wrong for a person to do is wrong for the state to do.*

---

*∴ It is wrong for the state to execute a murderer.*

Your criticism will be more effective if you show that you are aware that the conclusion of an argument can be made to follow by adding premises. (This point was made in chapter 3.) Often the premise or premises left unstated are precisely the ones that, if made explicit, can be seen to be doubtful. A good procedure, then, is to point out first that the argument, as stated, is invalid. Second, you can raise the possibility of adding premises yourself. You might formulate the premise or premises that would make the argument valid, then discuss whether these premises are deserving of belief. In our expanded version of Example 4.12, the added premise says that *Everything that is wrong for a person to do is wrong for the state to do.* To cast doubt on this premise, you can point out that if it were true, then not only would the state be wrong in executing murderers, the state would also be wrong in imprisoning *any* offenders, levying taxes, or generally carrying out any of the functions of government that are beyond the just power of any individual citizen.

We can now return to criticizing the premises in Example 4.11. They were:

1. *John has withheld information.*
2. *Withholding information is lying.*
3. *Anyone who has lied has done something wrong.*

Premise 3 can be criticized by giving counterexamples to this generalization. It is doubtful that someone who has lied to prevent great harm to another has done something wrong.

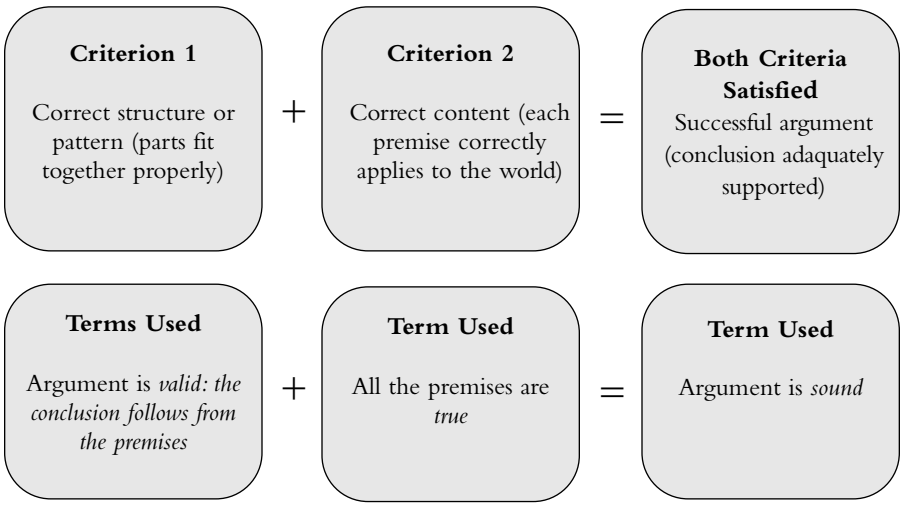
Premise 2 asserts a conceptual relationship between withholding information and lying. We discuss the criticism of claims such as these at some length in chapter 7. The arguer in this case is guilty of stipulating a meaning of *lying* that is not ordinarily assumed by people who use this word, then proceeding in the argument with this misleading definition.

Premise 1 is the kind of claim that might be criticized on the basis of direct observation or reports of direct observation. Suppose John has been accused of selling his house without telling the buyer that the basement walls leak. Maybe you or someone else actually heard John say that the basement walls leak. Or, in the absence of such direct evidence, the premise could be supported by a further argument that we would then have to evaluate. For example, the buyer of the house could argue that all the junk John piled up against the water-stained wall was a deliberate attempt to hide its condition.

Even if there is direct observational evidence, this doesn't settle the matter with absolute certainty. We sometimes make mistakes about what we see and hear. And studies of "eyewitness testimony" in connection with criminal justice research have clearly indicated that our memory for what we have supposedly seen can be notoriously inaccurate.

Philosophers and logicians have been trying at least from the time of Descartes (1596–1650) to establish unassailable foundations for all our reasoning. Unfortunately, efforts by philosophers to find a list of unassailably true premises with the same kind of certainty and precision that logicians have achieved in establishing the validity of argument patterns have been unproductive if not misguided. Still, we are sometimes justified in *accepting* premises as true, even if we lack absolute certainty. If the arguments in which these premises occur also follow correct patterns (that is, are valid), then we are justified in accepting these arguments as *sound*.

One of the main points of this chapter, which we have tried to emphasize in the sample appraisals we have just considered, is that we have to evaluate two separate features in arguments. We must be aware of each and not get confused. First there is the structure or pattern—the way the premises and conclusion fit together. When the argument has a correct pattern, we say that *the conclusion follows from the premises*, or to use the more technical term of the logician, the argument is *valid*. Second, there is the content of the premises—broadly, what they say about the world. When we evaluate the premises we decide whether to accept them as *true*. When an argument satisfies both these criteria—when it is *valid* and *all the premises are true*—then it is a *sound argument*. We are then justified in accepting its conclusion.



## Exercise 4.3 Distinguishing the Validity of an Argument (That Is, Whether the Conclusion Follows) from the Truth of Its Premises

1. For each argument state
   (i) whether or not the conclusion follows, and if so
   (ii) whether or not the premises are true.

   a. *(1) Every U.S. president has been a faithful husband.*
   *(2) Franklin Roosevelt was a U.S. president.*

   *∴ Franklin Roosevelt was a faithful husband.*

   b. *(1) Every U.S. president is a U.S. citizen.*
   *(2) I am not the U.S. president.*

   *∴ I am not a U.S. citizen.*

   c. *(1) If I pay my taxes on time, the Internal Revenue Service will be satisfied.*
   *(2) I won't pay my taxes on time.*

   *∴ The IRS won't be satisfied.*

   d. *(1) All dogs are mammals.*
   *(2) All mammals are animals.*

   *∴ All dogs are animals.*

2. Write in standard form an example (of your own creation) of each of the following:
   a. An argument that is valid but obviously unsound.
   b. An argument that is obviously sound, given common knowledge.
   c. An argument that is invalid and has at least one false premise.
   d. An argument that is invalid but has true premises and a true conclusion.
3. One aspect of the terminology we have introduced may be confusing. In ordinary speech, we occasionally refer to individual statements as "valid," as in "The speaker made a valid point." In these cases, *valid* means "acceptable" or "true." As we are using the term, however, it is only *arguments* that are valid

or invalid. Validity does not apply to individual statements. Likewise, only arguments are sound or unsound. On the other hand, only individual *statements* are true or false. It is inappropriate to call an argument true or false.

3(i). Which of the following statements make sensible use of the terms?

a. The argument you just gave is true.
b. Your premises are unsound.
c. Your conclusion is false.
d. Your statement is true.
e. Your statement is invalid.
f. You are arguing from true premises to an invalid conclusion.

3(ii). Which of these statements are consistent—that is, for which of them can the two parts both be true together?

a. Your argument is sound, but not valid.
b. Your argument is valid, but your conclusion is false.
c. Your argument is valid, but not sound.
d. Your argument is sound, but your conclusion is false.

## Some Special Cases: Arguments That We Should or Should Not Do Something

Think of how frequently our discussions focus on whether we should or should not do something. Should we ban smoking in public places? Should potential parents be informed of the gender of their baby-to-be? Should guns be more tightly restricted? Should capital punishment be abolished? These are typical of the issues discussed in newspaper editorials and public forums. Conversations among individuals focus more commonly on personal issues, but even then, the question is often what someone should do.

Because this question is so common, reconstructions of arguments will often take the form of premises that give reasons for or against doing something and a conclusion stating what we should or should not do. We discuss here how these arguments can be treated as roughly fitting certain common patterns from our list, but with certain qualifications.

**We Shouldn't Do A, Because A Will Result in B** Consider a reconstruction of an argument from the editorial on gun control that appeared in chapter 3:

***Example 4.13 (implicit)***

*(1) If gun ownership is restricted, then it is easier for criminals to prey on decent folks.*

*(2) It should not be easier for criminals to prey on decent folks.*

*∴ Gun ownership should not be restricted.*

You will see this general kind of argument again and again.

***Example 4.14***

***A Pattern in Example 4.13***[6]

*(1) If A, then B.*

*(2) B shouldn't happen.*

*∴ A shouldn't happen (or alternatively, we shouldn't do A).*

Because this kind of argument is so common, it is important to decide whether it can be taken as following a valid pattern. In particular, should we take it as following something like *modus tollens:*

***Example 4.15***

***Modus Tollens Pattern***

*(1) If A, then B.*

*(2) Not B.*

*∴ Not A.*

The argument pattern in Example 4.14 is similar to *modus tollens* in some respects (but not all). Like *modus tollens*, the pattern of the argument above can be contrasted to a kind of argument that is clearly *not* valid:

***Example 4.16***

| ***Invalid Pattern*** | ***Fallacy of Affirming the Consequent*** |
|---|---|
| *(1) If A, then B.* | *(1) If A, then B.* |
| *(2) B should happen.* | *(2) B.* |
| *∴ A should happen.* | *∴ A.* |

The conclusion doesn't follow, because (for one thing) there could be other, better ways to make B happen. Consider the similarity between the following two instances of these invalid patterns:

6. The "pattern" is roughly stated for simplicity. A closer approximation would be: If A, then B, it shouldn't be brought about that B. Therefore, it shouldn't be brought about that A. If premise A stands for a statement such as "gun ownership is restricted," in the conclusion, Not A stands for something like "that gun ownership is restricted shouldn't happen" or "we shouldn't bring it about that gun ownership is restricted."

***Example 4.17***

| ***Invalid Pattern*** | ***Fallacy of Affirming the Consequent*** |
|---|---|
| *(1) If we restrict the highway speed limit to 5 mph, then we would reduce highway deaths.* | *(1) If you're a dog, then you have feet.* |
| *(2) We should reduce highway deaths.* | *(2) You have feet.* |
| *∴ We should restrict the speed limit to 5 mph.* | *∴ You're a dog.* |

The conclusions don't follow because there are other, more convenient ways to save lives, and you could have feet by virtue of being something other than a dog.

Although there is a similarity in contrast between these invalid patterns and the patterns in question, there are also differences between *modus tollens* and the pattern in Example 4.13. Both begin by saying that if A happens, then B happens; however, *modus tollens* proceeds to say that B *doesn't* happen, not that it *shouldn't*. Given the premises of *modus tollens*, the conclusion has to follow. Suppose it's really true that *If I study, then I learn,* and that *I haven't learned*. It follows necessarily that *I must not have studied*. Compare this to the argument that *If gun ownership is restricted, then it will be easier for criminals to prey on decent folks,* and *It shouldn't be easier for criminals to prey on decent folks*. Does it follow with the same kind of necessity that *Gun ownership shouldn't be restricted?*

The answer to this question depends on how we interpret *shouldn't* in the second premise. If it merely means that making it easier for criminals to prey on decent folks is *undesirable,* then the conclusion that we should leave gun ownership unrestricted doesn't follow.[7] One undesirable thing can be outweighed by something else that is more undesirable. The increase in criminals preying on decent folks could be slight, but the increase in accidental deaths due to lack of restriction on firearms could be great. We could then accept that it is undesirable to make it easier for criminals to prey on decent folks, but still conclude that we should restrict gun ownership.

We could, however, interpret *shouldn't* to mean something stronger, such as, "All things considered, this must not be allowed to happen." If it were true in this sense that it *shouldn't* be easier for criminals to prey on decent folks, and true also that restricting gun ownership would have this result, then the conclusion would follow that we should leave gun ownership unrestricted. Keep in mind, though, that this stronger version of the premise would be much more difficult to accept.

7. Or, if it did follow that we should not restrict gun ownership, it would be only in the weak sense that restricting gun ownership would have one undesirable effect, leaving open the possibility that we should restrict it nevertheless. Surely this is not what the arguer intends.

You would need to consider *all* the likely consequences of restricting gun ownership and of not restricting it, and then decide that the likely increase in criminals preying on the innocent would be an overriding consideration.

The lesson to be learned from the analysis of this kind of argument is to be cautious. If the argument is simply *If A, then B, B is bad*, so *we shouldn't do A,* then the conclusion doesn't follow. If the argument is taken in the stronger sense of *If A, then B, all things considered B must not be allowed to happen*, therefore *we shouldn't do A*; the conclusion follows but the second premise will be harder to accept.

A slight variation of this same kind of argument is: If we *don't* do A, then B. B shouldn't happen. Therefore, we *should* do A. An instance would be: If we don't restrict gun ownership, then homicide rates will increase. Homicide rates shouldn't increase, therefore we should restrict gun ownership. This argument also is valid only if the second premise is taken in the strong sense, not the weak sense of "it would be undesirable for homicide rates to increase." Again, we must be cautious about accepting this kind of argument.

**We Should Do A, Because A Will Result in B** Another kind of argument urges us to do something, not to avoid some unacceptable result but to bring about something good. For example, we should enact the health bill because more people will receive care. How should we interpret an argument of this kind?

One way *not* to interpret it is by adding an implicit premise to produce the following:

***Example 4.18*** ***Faulty Interpretation***

*(1) If we enact the health bill, then more people will receive care.*

***(implicit)*** *(2) More people should receive care.*

*∴ We should enact the health bill.*

This interpretation commits the same fallacy as the argument about saving lives by restricting the speed limit (Example 4.17). What, then, is the alternative? We could interpret it along the lines of *modus ponens:*

***Example 4.19*** ***Better Interpretation***

***(implicit)*** *(1) The health bill will provide care to more people.*

*(2) If the health bill will provide care to more people, then we should enact it.*

*∴ We should enact the health bill.*

Alternatively, we could make the implicit premise more general:

***Example 4.20*** ***Alternative Interpretation***

*(1) The health bill will provide care to more people.*

***(implicit)*** *(2) Any bill that will provide care to more people should be enacted.*

*∴ The health bill should be enacted.*

It should be noted that premise 1 of either argument might appear in the passage you are interpreting as an if-then sentence *(If the health bill is enacted, then it will provide care to more people).* Such a premise must be rewritten as a simple declarative sentence to avoid making the implicit premise too complicated. (Consider how difficult it would be to understand the following premise: *If it is the case that if the health bill is enacted, it will provide care to more people; then it should be enacted.*)

Arguments like those in Examples 4.19 and 4.20 must also be evaluated with caution. The fact that an action will have *one* good result won't always justify carrying it out. The positive result of extending coverage must be weighed against possible negative results (such as expense in the case of the proposed health bills). Exercise set 4.4 at the end of this chapter includes a number of arguments with conclusions that we should or should not do something. Keep the discussion from this section in mind as you reconstruct and evaluate them.

## The Rationale for Using These Critical Techniques

The procedure we have recommended for understanding and criticizing arguments is fairly simple: boil a passage down to its stated premises and conclusion (rephrasing if necessary); add any unstated premises or conclusion; determine whether the conclusion follows and whether the premises should be accepted.[8] Now we raise the question: Why use this procedure? We can give a partial answer at this time by contrasting our procedure to what is probably the most common way of criticizing an argument: simply to attack the conclusion. This approach is in line with the activity of mere disagreement that we contrasted to critical reasoning in chapter 1. The problem with this approach is that it does not help us in progressing toward a better-justified set of beliefs.

The point of interpreting your opponent's position as an *argument* is that then you can make progress toward determining whether one of you should change your position. You can ask whether the reasons (premises) given for the

8. An elaboration of this procedure will be presented in chapter 10.

conclusion are ones that you have grounds for believing, or grounds for doubting. And you can ask if the conclusion follows from these reasons (premises).

Let us illustrate this point. Suppose someone has claimed that killing is wrong and capital punishment is killing, so capital punishment is wrong. The least fruitful way of replying would be: "No, capital punishment is not wrong." To stubbornly adhere to this, without regard for the argument that has been presented, is to miss the point of argument and criticism. You have been given reasons for believing that capital punishment is wrong. If you agree with the statements given as reasons, and if the conclusion follows from these reasons, then you should change your mind and agree to the conclusion. If you can show that your opponent should *not* believe the statements given as reasons, or that the conclusion does *not* follow, then your opponent should give up this argument. You could then press your opponent: "Was this the only reason you had for believing your conclusion? Let's look at any other arguments you might have made. Let's look at some arguments against believing that capital punishment is wrong. Perhaps there is an argument on one side or the other that we find conclusive."

Admittedly, there are cases in which it would be appropriate to deny the conclusion of someone's argument. Suppose that someone is presenting an argument that it will not rain today because of the combination of barometric pressure, temperature, and humidity. Just as the person is finishing the argument, you look out the window and see the rain coming down. Of course, it is perfectly appropriate to say, "I don't know where your argument went wrong, but we can see that your conclusion is false."

Still, this is an exceptional case. Usually, we make an argument when our conclusion is one that someone might doubt and we do not have a direct means of determining if it is true. That is why we must look for premises to support our conclusion. And in this standard sort of case, it is not appropriate simply to deny the conclusion.

The same considerations apply when you are defending your own position. It is not enough merely to assert unsupported statements. You should build your argument on the firm foundation of true premises interconnected in a valid argument form.

## Writing Critical Comments

The techniques of criticism discussed in this chapter may be used to structure critical comments. You should always consider whether an argument is valid and its premises true. The four-step process suggested below will help you draft a critical remark or expand on critical statements you have already written. Of course, as in any piece of writing, you must keep in mind the expectations of your audience. Critical comments will take different forms, depending on whether, for

example, you are responding to a passage in a critical reasoning course, writing a short answer on an examination, or creating a paragraph that will be placed in a longer essay.

1. Present the elements of the argument that are relevant to your criticism, but not in painful detail. Include any important, implicit premises.
2. Indicate whether the conclusion follows. (If it does not, add remarks to help the reader see its inadequacies.)
3. If the premises are questionable, say what you can to cast doubt on them.
4. Consider whether a modest reformation will produce an improved argument. (Employ the Principle of Charitable Interpretation in a liberal manner.)

A passage constructed in accordance with these four suggestions may be edited later in the process of producing a polished criticism. Let's apply these suggestions to an argument cited in a hypothetical news item.

***Example 4.21 News Item***

*Lynn Gianini, Chair of the Governor's Committee on Violence Against Women, would like to see habitual sexual offenders in prison for life. "Anyone who is likely to commit another major sexual offense should be under the control of the state," she said at Tuesday's press conference. "That is why I would like to see rapists receive life sentences." The argument can be reconstructed so that it fits one of our patterns, the universal syllogism. A premise and conclusion are fairly explicit.*

***Reconstructed Argument (implicit)***

*(1) All rapists are likely to commit another major sexual offense.*

*(2) Anyone who is likely to commit another major sexual offense should be given a life sentence.*

---

*∴ All rapists should be given a life sentence.*

However, the first premise of this argument is an easy target for criticism, and the conclusion, even though it is nearly the same as Gianini's statement, might go further than she intended. It is questionable whether those guilty of single offenses are *all* likely to commit another offense, especially if we consider the age of the offender. Also, "rape" is a broad category, ranging from "statutory rape" in which there is consensual sex between individuals who may only be a few years different in age to first-degree sexual assault. A more defensible version of the argument would probably specify certain categories of rapists—perhaps second offenders or those whose crimes had other aggravating circumstances—as those who should receive life sentences.

These observations can be formed into a critical comment.

> *Committee Chair Gianini, in a recent news item, stated that rapists should be given life sentences. She based this view on the proposition that those who are likely to commit another major sexual offense should be under the control of the state. If she means by her conclusion that* All rapists should receive life sentences, *then her argument makes an assumption that is at least questionable: all rapists are likely to commit another major sexual offense. Perhaps all those who have already been convicted of more than one serious sexual offense are likely to commit yet another. But what about a young person who has committed a single offense? What if this offense is of a lesser degree, such as "statutory rape"? If we take Gianini to be arguing that all those who have already committed a major sexual offense, or who have repeatedly committed such offenses, then her conclusion is better supported by her reasoning that those who are likely to commit a major sexual offense should be under the control of the state.*

Consider another hypothetical news item.

***Example 4.22 News Item***

> *Senator Malcom Bismark emerged from the State Transportation Committee meeting with the gloomy prediction that we will not be able to overcome the crisis of congested, deteriorating highways. He said that if the federal government would support the states in improving their transportation systems, we could survive this crisis. But as recent budget cuts indicate, the federal government is unwilling to support the states in this endeavor.*

A reconstruction of the argument, setting out the basic elements of the passage, helps us to see that the conclusion doesn't follow.

***Reconstructed Argument***

> *(1) If the federal government supports the states in improving their transportation systems, then we can overcome the crisis of congested, deteriorating highways.*
>
> *(2) The federal government won't provide this support.*
>
> ---
>
> *∴ We will not be able to overcome the crisis of congested, deteriorating highways.*

Since the conclusion does not follow, we need not consider whether the premises are true. However, there is another interpretation of the first premise that makes the argument valid; unfortunately this restated premise is questionable.

***Reformulated Argument (reformulated)***

*(1) We can overcome the crisis of congested, deteriorating highways only if the federal government supports the states in improving their transportation systems.*

*(2) The federal government will not support the states in improving their transportation systems.*

---

*∴ We will not be able to overcome the crisis of congested, deteriorating highways.*

These observations about the argument in the news item can be formed into a critical comment.

> *Senator Bismark, in a recent news item, suggests that Americans will not be able to overcome the crisis of congested, deteriorating highways. He argues that if the federal government would support the states in improving their transportation systems, we would be able to overcome this crisis. But he claims that Washington won't lend this support. As he states his argument, Bismark's conclusion doesn't follow from his premises. Federal support may be one way to overcome the crisis, but there may also be other ways. Perhaps the senator meant to say that we will overcome the crisis in transportation only if the federal government supports the states. His conclusion would then follow, but it is questionable whether this new premise is true. It is at least possible that a combination of private ventures, for example, toll roads, together with support from the states themselves, will suffice to significantly improve transportation in America.*

## Exercise 4.4 Criticizing Arguments

1. Write a paragraph or two criticizing each of the following arguments. Use the four suggestions offered in the text. First, set out the argument. (You might find it useful to sketch a version of the argument in standard form on a piece of scratch paper to help you determine its structure and whether it has any missing premises.) Second, indicate whether the conclusion follows. Third, see if you can cast doubt on any of the premises. (When you do this, don't just make a general statement aimed at discrediting several premises at once; instead, tackle the premises specifically, one at a time, clearly saying which premise you are attacking.) Fourth, consider relevant reformations and whether they can be criticized.

   a. Football should be discouraged, for the reason that football makes people aggressive, and any activity that makes people aggressive should be discouraged.

b. The United States is not really democratic, since if it were democratic, each person's opinion would have a significant effect on government.
c. If the government's antidrug policies are effective, then drug use will begin to decline. Drug use is beginning to decline. So the government's antidrug policies are effective.
d. If you should not be blamed for what your ancestors did, then neither can you take pride in their deeds. It would follow that you are not entitled to take pride in what your ancestors accomplished.
e. If the average couple has more than two children, the population will rise drastically. But we should prevent the population from rising drastically. So we should prevent any couple from having more than two children.
f. If the universe was created, then there was a time at which it did not exist. If there was a time at which it did not exist, then there was a time at which nothing was converted into something. But this is impossible. So the universe was not created.
g. We shouldn't allow doctors to determine the gender of a fetus whenever parents request it. This is so because if we allow such testing, then some parents will abort a fetus simply because of its gender.
h. People have the right to do whatever they want to with their own bodies. Therefore, a pregnant woman has the right to have the fetus aborted if she wants to.
i. All tax increases are unjustified at this time. But since user fees to get into national parks are not taxes, increasing them is justified.
j. No one should get married. This is so because getting married involves promising to live with a person for the rest of one's life. But no one can safely predict that he or she will remain compatible with some other person for life.
k. People should pay taxes to support only parts of government they use. It stands to reason that people without children shouldn't be required to pay for schools.

2. Read the following newspaper column and reconstruct what you take to be its main argument. (This is to some degree a matter of interpretation.) Write out the argument in standard form so that it follows a valid pattern. Then write a few paragraphs evaluating the premises.

**Networks Don't Get Connection**[9]

by Cal Thomas

ABC Television broadcast a special "Men, Sex and Rape," last week that was, as *New York Times* reviewer Walter Goodman noted, full of "pretension to virtue."

After the obligatory tabloid-television approach featuring "swelling breasts and buttocks, mostly amid the sands of Palm Beach," as Goodman summarized it, the program attempted to move to the brain for some serious discussion of a troubling subject. The approach had the moral impact of going to confession after a long-planned orgy.

First Amendment absolutists have resisted every attempt to control the huge levels of effluent that have turned our society into a toxic waste dump. Then they create programs like the one broadcast on ABC in which they wring their hands and decry what they have helped to create. It would be like the tobacco industry criticizing the growing number of lung-cancer deaths.

Women are being raped in record numbers—as many as 1,871 per day if one rape-victims rights group is accurate.

One does not have to be a social scientist to see a connection between increased incidents of rape, and other acts of violence against women, and the way women are treated in the popular media. One quick look at MTV offers a sample of the diet on which many young people feed at an early age.

A new Michael Jackson video called "In the Closet" features Michael and a woman thrusting their pelvises at each other. Michael sings, "there's something about you, baby, that makes me want to give it to you."

This video is followed immediately by another called "Baby's Got Back," in which women are shaking their behinds at the camera, various fruits and vegetables shaped like body parts are shown, and the rapper says he likes women's buttocks and feels like "sticking it" to them.

Pornography is worse, of course, but this stuff is what might be called the beginners' material for the raping of the young American mind.

Andrea Dworkin, the feminist writer who has crusaded for tougher anti-pornography laws, wrote a profound letter to the *New York Times* last week in which she told of her own sexual abuse. She believes rape is linked to the tolerance and promotion of pornography and sexual images that give

9. Op-Ed, *Seattle Post-Intelligencer,* 14 May 1992, A1. © 1992, Los Angeles Times Syndicate. Reprinted with permission.

cultural permission for men to treat women as objects, not fellow human beings.

To the purists who will not tolerate any controls on "speech" or pictures, Dworkin wrote: "Freedom looks different when you are the one it is being practiced on. Those sexy expletives are the hate words he uses on you while he is using you." Dworkin added that men "act out pornography. They have acted it out on me." She correctly indicted men who hide behind the First Amendment so they can traffic for profit in women's misery. "They eroticize inequality in a way that materially promotes rape, battery, maiming and bondage; they make a product they know dehumanizes, degrades and exploits women; they hurt women to make the pornography, and then consumers use the pornography in assaults both verbal and physical."

For networks (or movie and magazine publishers) to claim that there is no connection, or that they are not responsible if there is a connection, between pictures and words and the brutalizing of women is a lie. Do they tell their advertisers there is no connection between consumer behavior and images of soap, cars and beer? Not if they want to sell ad space and commercial time. For advertisers, they make the opposite claim.

Chris O'Sullivan, a social psychologist who is writing a book on group sexual assault on college campuses, sees a link between sex crimes and visual images. In a letter to the *New York Times,* he wrote: "There is a higher level of aggression, sexual and nonsexual, among those who most often expose themselves to depictions of sexual and nonsexual violence than among those who do not."

Were such a connection established, or even likely, in any other field, government would quickly move to do something about it. Kentucky Republican Sen. Mitch McConnell is trying to take a small step towards clearing up the mainstream of some of this filth in his bill that would compensate victims of sexual assault who could link the assault to pornography. Most of the media establishment has written editorials and lobbied against the bill.

Yet, it is a bill and an idea deserving of support. Women deserve as much protection against rape as it is possible for society to offer. As Dworkin wrote: "A photograph sells rape and torture for profit. In defending pornography, as if it were speech, liberals defend the new slavers. The only fiction in pornography is the smile on the woman's face."

If rape is a terrible crime, and it is, and if there is a connection between pornography and the cultural permission it gives those already predisposed to perform these acts on women, then the government has an obligation and duty to control its proliferation. The McConnell bill is a good place to start.

CHAPTER FIVE (OPTIONAL)

# When Does the Conclusion Follow? A More Formal Approach to Validity

The informal discussion of validity found at the beginning of chapter 4 described the structural relationship between the premises and conclusion in a valid argument. It tried to capture the sense of logical necessity in which, if an argument is valid and its premises are true, it is necessary for the conclusion to be true. Or, to put it another way, an argument is valid if and only if it is logically impossible for all the premises to be true and the conclusion false.

The illustrations given in chapter 4 appealed to your informal sense of necessity or impossibility. Logicians (philosophers interested in the validity of arguments) have devised a variety of more formal techniques for illustrating the concept of *logical necessity* and the related concept of *logical impossibility*, which in turn are ways of systematically illustrating the concept of validity. Further, these methods provide us with useful techniques for testing whether an argument is valid.

The method used by logicians is formal in the sense that it abstracts the form or pattern of an argument from its verbal content. This is seen as an appropriate move because validity is a feature of the structure of an argument independent of its particular content. More generally: an argument is valid if and only if all arguments of the same form are such that it is impossible for all the premises to be true and the conclusion false. When validity is tied to form in this way, we can speak of the logical impossibility of having all the premises true and the conclusion false.

In an effort to characterize the form of arguments, logicians have introduced standard ways of presenting an argument. We have taken some steps in this

direction in our chart of Some Common Successful Argument Patterns. For example, we gave the form of *modus ponens* as

***Example 5.1***

*(1) If A, then B.*

*(2) A.*

---

*∴ B.*

In this example, the capital letters *A* and *B* were used to stand for statements in an argument.[1] We have also numbered the premises, drawn a line, and used the symbol ∴ meaning "therefore" to indicate that we have an argument with premises and a conclusion.

Logicians commonly go even further in their use of symbols. Whereas we have continued to use fragments of English such as "If . . . then . . . " and "Either . . . or . . . " to display more complex, logical features of statements, logicians typically illustrate form by using special symbols roughly (but only *roughly)* the equivalent of the English language terms we have employed. So, for example, the following table gives these symbols for some common "logical words" that apply to whole statements. These logical words are often called *logical connectives;* most *connect* two or more statements.

| ***Symbol*** | ***Name*** | ***Example*** | ***Rough English Equivalent*** |
|---|---|---|---|
| ¬ | Negation | ¬ A | It is not the case that A |
| & | Conjunction | A & B | A and B |
| ∨ | Disjunction | A ∨ B | Either A or B (or both)[2] |
| → | Conditional | A → B | If A, then B |
| ↔ | Biconditional | A ↔ B | A if and only if B |

Using these symbols we could illustrate some of the standard statement-based argument forms as follows:

1. We use the term *statement* rather than *sentence* because the same sentence (for example, "It flew") can be used to make different statements on different occasions depending on the reference of the pronoun. Further, different sentences can be used to make the same statement (for instance, "It flew," and "The plane flew").

2. This use of ∨ to include the case when both are true is called the *inclusive* use of *or* as opposed to the *exclusive or*, which excludes this case.

| ***Modus Ponens*** | ***Modus Tollens*** | ***Disjunctive Argument*** | ***Hypothetical Argument*** |
|---|---|---|---|
| *(1)* $A \rightarrow B$ | *(1)* $A \rightarrow B$ | *(1)* $A \vee B$ | *(1)* $A \rightarrow B$ |
| *(2)* $A$ | *(2)* $\neg B$ | *(2)* $\neg A$ | *(2)* $B \rightarrow C$ |
| $\therefore B$ | $\therefore \neg A$ | $\therefore B$ | $\therefore A \rightarrow C$ |

These symbols can be used to present a variety of more complicated arguments. For instance

*(1)* $A \rightarrow B$
*(2)* $C \rightarrow D$
*(3)* $(B \,\&\, D) \rightarrow E$
*(4)* $A$
*(5)* $C$

$\therefore E$

*(1)* $A \rightarrow B$
*(2)* $C \rightarrow D$
*(3)* $A \vee C$
*(4)* $\neg B$

$\therefore D$

## Exercise 5.1 Formalizing

1. Assign letters to each *simple* statement given below and use our connective symbols to "translate" the more complex statements built out of them into our formalism using letters and symbols as described in the previous section.
   a. The war on drugs will continue.
   b. If the war on drugs continues, then prisons will remain crowded.
   c. If the United States does not continue to wage a war on drugs, then drug use might increase.
   d. Either prisons will remain crowded or vast sums will be spent on new prisons.
   e. If vast sums are spent on new prisons, then either taxes will remain high or other social problems will be ignored.
   f. The war on drugs will continue, and prisons will remain crowded.
   g. If the war on drugs continues, and prisons remain crowded, then some violent criminals will be released prematurely, and society will be victimized.
   h. The prison population will subside if and only if drug penalties are reduced.

i. If the United States will not keep taxes high and build more prisons, then the United States must reduce drug penalties. **(Hint: Use parentheses to group elements together. For instance, "Both A and B, or C" can be grouped ((A & B) ∨ C).)**

2. The following statements have less obvious translations into our formalism.

   a. It is not the case that the war on drugs will not continue.
   b. Prisons are crowded now, but this will not be a problem if drug arrests decrease. **(Hint: *But* can typically be translated like "and.")**
   c. The war on drugs will continue unless political sentiments in the United States change. **(Hint: *Unless* can often be translated like "or.")**
   d. The prison population will subside only if drug penalties are reduced. **(Hint: A *only if* B can often be translated like "If A, then B.")**
   e. Neither will the prison population subside nor will drug penalties be reduced. **(Hint: *Neither A nor B* can be translated like "It is not the case that either A or B" and also like "It is not the case that A, and it is not the case that B." As we will see in the next section, the latter two statements in a sense say the same thing.)**

3. a. Translate the arguments in Exercise 3.1, la–e into our formalism. Be sure to indicate which letter stands for which statement.
   b. Translate the various reconstructions found in Exercise 3.1, 3a(i, ii, iii), 3b(i), and 3c(i) into our formalism. Be sure to indicate which letter stands for which statement.

4. Translate the following arguments into our formalism:

   a. *(1) Either prisons will remain crowded or vast sums will be spent on new prisons.*

      *(2) If vast sums are spent on new prisons, then taxes will remain high.*

      *(3) Taxes will not remain high.*

      ---

      *∴ Prisons will remain crowded.*

   b. *(1) If the AIDS epidemic continues unabated, then there will be an increased burden on our already-strained health care system.*

      *(2) If there will be an increased burden on our already-strained health care system, then there will be increased pressure for the federal government to provide money to save the health care system.*

*(3) If there will be increased pressure for the federal government to provide money to save our already-strained health care system, then taxes will have to be raised.*

---

*∴ If the AIDS epidemic continues unabated, taxes will have to be raised.*

c. *(1) The United States will insure long-term prosperity only if it devotes more of its wealth to long-term economic development.*

*(2) It will devote more of its wealth to long-term economic development only if the government changes its antitrust laws to allow much greater cooperation among competing companies.*

*(3) The United States will not change its antitrust laws unless American consumers become willing to pay much more for their consumer goods.*

*(4) American consumers will not become willing to pay much more for their consumer goods.*

---

*∴ The United States will not insure long-term prosperity.*

d. *(1) A widespread spiritual awakening will occur in the United States by the year 2010 if and only if personal success becomes measured by the quality of a person's character, not the size of his or her wallet.*

*(2) Personal success will continue to be measured by the size of a person's wallet unless American education concerns itself with issues of ethics and morality.*

*(3) America will continue to be able to accommodate an impressive variety of cultural groups only if American education does not concern itself with issues of ethics and morality.*

---

*∴ America will continue to be able to accommodate an impressive variety of cultural groups only if a widespread spiritual awakening will not occur in the United States by the year 2010.*

## Statements Containing Logical Connectives: When Are They True; When Are They False?

To evaluate whether an argument is valid, it is necessary to consider the situations in which the statements that make it up are true or false. If we are considering statements in our "idealized" form, the simplest situation is that in which we consider only a single letter—for instance, *A*. With respect to this statement, only two possible situations exist, either A is true or A is false. We can represent these alternatives as follows:

| *A* |
|---|
| T |
| F |

Given these two possible situations, we can determine the truth value of the slightly more complicated statement we obtain by negating A. In the situation in which A is true, the negation of A ("It is not the case that A . . . ") is false, and when A is false, the negation of A is true. We can represent these alternatives as:

| *A* | $\neg A$ |
|---|---|
| T | F |
| F | T |

We can extend this way of evaluating the truth statements to embrace compound statements created when we connect two simpler statements to form a conjunction, disjunction, conditional, or biconditional. To represent the possible situations when we have two statements linked by one of the logical connectives, first we have to display the joint possibilities. If we have two statements, when the first is true, the second can be either true or false, and when the first is false, the second can again be either true or false. This gives us four possibilities: (1) both are true, (2) the first is true and the second false, (3) the first is false and the second true, or (4) both are false.

| *A* | *B* |
|---|---|
| T | T |
| T | F |
| F | T |
| F | F |

This allows us to define the various logical connectives. A conjunction (for example, A & B) is true if both elements are true (for instance, both A and B). It is false otherwise.

This can be displayed graphically as

| ***Possible Situations*** | | ***Truth Value of Compound Statement*** |
|---|---|---|
| *A* | *B* | *A* & *B* |
| T | T | T |
| T | F | F |
| F | T | F |
| F | F | F |

A disjunction (for instance, A ∨ B) is true if one element or the other or both are true (for example, A is true or B is true or both are true). It is false otherwise. This captures the *inclusive* sense of *or* that includes the case in which both disjuncts are true.

| ***Possible Situations*** | | ***Truth Value of Compound Statement*** |
|---|---|---|
| *A* | *B* | *A* ∨ *B* |
| T | T | T |
| T | F | T |
| F | T | T |
| F | F | F |

A conditional is true if either the first element is false or the second element is true. It is false only if the first element is true and the second false.

| ***Possible Situations*** | | ***Truth Value of Compound Statement*** |
|---|---|---|
| *A* | *B* | *A* → *B* |
| T | T | T |
| T | F | F |
| F | T | T |
| F | F | T |

A biconditional is true if both elements are true together or false together. It is false if they have different truth values.

| ***Possible Situations*** | | ***Truth Value of Compound Statement*** |
|---|---|---|
| *A* | *B* | $A \leftrightarrow B$ |
| T | T | T |
| T | F | F |
| F | T | F |
| F | F | T |

The definition of the logical connective **&** is closely related to our informal understanding of the connective *and*. But you should not assume, even in this case, that the formal, logical connective is a perfect "translation" of the everyday term. Consider the two statements:

*A: The student took the exam.*

*B: The student looked at the answers.*

The statement A & B has the same truth value as the statement B & A although you might well distinguish the first from the second:

*The student took the exam and the student looked at the answers.*

*The student looked at the answers and the student took the exam.*

Sometimes *and* means "and then" in English. The connective **&** does not capture the meaning "and then." Similarly, when a parent says, "You can have either cookies or cake," it is usually meant in the "exclusive" sense that the child can have one or the other but not both. If we translated this statement as $A \vee B$, we are treating it as involving not this exclusive sense but the inclusive sense of *or* that allows for both to be true. To represent the strictly exclusive sense we would need a more complicated expression:

$((A \vee B)\ \&\ \neg\ (A\ \&\ B))$[3]

3. The truth table for "exclusive or" (xor) is

| *A* | *B* | *A xor B* |
|---|---|---|
| T | T | F |
| T | F | T |
| F | T | T |
| F | F | F |

The conditional "→" provides an even rougher translation of the English analogue "If . . . then . . ." Suppose we have the statement *If I lie, then I'll be sorry.* It seems reasonable enough to call this premise true if I do lie and I am sorry. And it is surely reasonable to call it false if I do lie and I am not sorry (rows 1 and 2 in the graphic display for the conditional). But why call it true if I don't lie but I'm still sorry, or if I don't lie and I am not sorry (rows 3 and 4 on the display)?

According to the definition of the conditional we have given, there is no difference in truth value between a situation where the first element (the "if" part) is false but the whole sentence is true, and a situation in which the first element is false but the whole sentence is false.[4] To preserve the simplicity of our method of relating the truth of the elements in a compound sentence to the truth of the whole so that the truth of the whole is a *function* of just the truth value of the parts, we accept some slack in our translation of the if-then statement. We take *If I lie, then I'll be sorry* to assert nothing more than *It won't be the case that I'll lie and not be sorry*. That is, the only situation in which we say that *If A, then B* is false is when A is true and B is false. Suppose I said, *If you pay me ten dollars, then I'll juggle fourteen eggs*. I might insist that my statement wasn't false if you don't pay me and I don't juggle. And if you don't pay but I juggle the fourteen eggs anyway, then you certainly can't complain that I lied. But if you do pay me and I don't juggle, then my statement clearly wasn't true.

In the examples given above, we examined compound statements consisting of a logical symbol and one or two statement letters. But the definitions for the symbols apply even when they link more complicated expressions. For example, all the following expressions are also negations:

$$\neg\ (A\ \&\ B)$$
$$\neg\ (\neg\ A \rightarrow B)$$
$$\neg((A\ \&\ B) \vee (C \leftrightarrow D))$$

As in the instance of simple negations, the truth value of the whole compound depends on the truth of the statement it contains. So, ¬(A & B) is true if (A & B) is false, and ¬(A & B) is false if (A & B) is true. Since the symbols can link complex elements, not just simple statements, we can display the various compound statements in a more general way. If we represent one element of a compound (no matter how complex) with a square □ and another with a triangle Δ, then the following display "defines" generalized compounds involving the logical symbols:

---

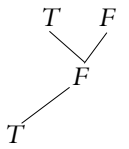
4. For example, assume that I won't snap my fingers. The most natural interpretation in this contrary-to-fact condition treats as true the statement, "If I snap my fingers, then I will hear a sound," and as false the statement, "If I snap my fingers, then I will turn into a bird," even though both are "true" in this counterfactual situation according to the definition of "→."

| ***Possible Situations*** | | ***Negation*** |
|---|---|---|
| ***Row*** | □ | ¬ □ |
| 1 | T | F |
| 2 | F | T |

| ***Possible Situations*** | | | ***Conjunction*** | ***Disjunction*** | ***Conditional*** | ***Biconditional*** |
|---|---|---|---|---|---|---|
| ***Row*** | □ | Δ | □ & Δ | □ ∨ Δ | □ → Δ | □ ↔ Δ |
| 1 | T | T | T | T | T | T |
| 2 | T | F | F | T | F | F |
| 3 | F | T | F | T | T | F |
| 4 | F | F | F | F | T | T |

We can use these generalized definitions to evaluate complex statements. For example, consider -(A & B). It is a denial that contains a conjunction as a part. To evaluate the truth of the whole denial, we need to determine the truth of the contained conjunction. Suppose that the simple statement A is T(rue) and B is F(alse). In this situation (row 2 of the definition), the conjunction is F(alse). We have now evaluated the contained conjunction; we know that it is false. But the overall statement is a negation of this conjunction. If we look in row 2 of the definition for negation, we see that, if the contained element is F(alse), the whole negation is T(rue). So in the situation in which A is T(rue) and B is F(alse), ¬ (A & B) is T(rue). We can represent these steps diagrammatically as follows:

***Example 5.2*** ¬ *(A & B)*



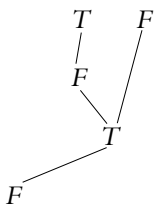

*Initial Assignment*

*Row 2 Conjunction*

*Row 2 Negation*

A similar technique will help us evaluate the compound ¬ (¬ A → B), where A is T(rue) and B is F(alse).

***Example 5.3*** ¬ *(¬ A → B)*




*Initial Assignment*

*Row 1 Negation*

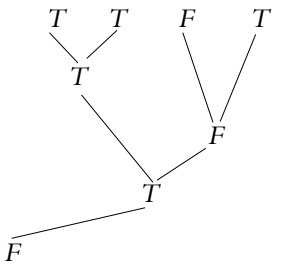
*Row 4 Conditional*

*Row 1 Negation*

Finally, consider the following assignment and evaluation:

***Example 5.4***

$\neg\ ((A\ \&\ B) \vee (C \leftrightarrow D))$




Initial Assignment
*Row 1 Conjunction*
*Row 3 Biconditional*
*Row 2 Disjunction*
*Row 1 Negation*

## Exercise 5.2 Evaluating Statements

1. Assume the following initial assignment of truth values to the statements: A is T(rue), B is F(alse). Use the techniques of evaluation listed above to evaluate the truth value of the following compound statements. Be sure to list the appropriate row and connective to justify each step in the evaluation diagram.

   a. $A \rightarrow \neg B$
   b. $\neg B \rightarrow A$
   c. $\neg (A\ \&\ \neg B)$
   d. $\neg A \vee \neg B$
   e. $\neg (A \leftrightarrow B)$

2. Evaluate the compound statements in step 1, but with the initial assignment A is F(alse), B is F(alse).

3. Assume the following initial assignment of truth values to the statements: A is F(alse), B is T(rue), C is T(rue), D is F(alse). Create evaluation diagrams for the following compound statements. (You don't need to list a justification for each step, but you should note to yourself how the definitions apply to each move you make.)

   a. $A \rightarrow (B \vee C)$
   b. $(A\ \&\ B) \rightarrow C$
   c. $(A \vee B) \rightarrow (C\ \&\ D)$
   d. $A \rightarrow (B \rightarrow C)$
   e. $(\neg A \rightarrow B) \vee (\neg D \rightarrow C)$

f. $(A \leftrightarrow B) \vee (\neg C \leftrightarrow D)$
g. $\neg((A \vee \neg B) \,\&\, C)$
h. $\neg (\neg ( \neg A \rightarrow B) \vee \neg ( \neg C \leftrightarrow \neg D))$

## Truth Tables As a Test for Validity

The method of evaluation for statements described in the previous section can be extended to evaluation of arguments by constructing a *truth table*. Such a table lists the truth or falsity of *all* the statements in an argument for all possible situations. A truth table can be used to assess whether an argument is valid—that is, to determine whether there is a possible situation that makes all the premises and the conclusion false. If we find such a counterexample, then the argument is invalid. If there is no such counterexample, then the argument is valid. Consider the argument and formalization below.

***Example 5.5***

| | |
|---|---|
| *(1) Either I should exercise or I should diet.* | *(1) $A \vee B$* |
| *(2) I should not exercise.* | *(2) $\neg A$* |
| *∴ I should diet.* | *∴ $B$* |

This argument involves only two simple statements. We can construct a table that lists the four possible situations—that is, initial assignments of truth or falsity to these two statements—much as we did in our definition of the connectives in the previous section. The truth table for the argument adds an evaluation for each of the statements in the argument (premises 1 and 2 and the conclusion) for each of these four possible initial situations.

| ***Initial Assignments*** | | | ***Evaluation of Statements for These Assignments*** | | |
|---|---|---|---|---|---|
| ***Possible Situations*** | | | ***Premises*** | | ***Conclusion*** |
| | *A* | *B* | *A ∨ B* | *¬ A* | *B (Repeated)* |
| 1 | T | T | T | F | T |
| 2 | T | F | T | F | F |
| 3 | F | T | T | T | T |
| 4 | F | F | F | T | F |
| | | | Disjunction | Negation | |

Each row represents a possible situation. As in our previous discussion, the first line, for example, is a situation in which A is true and B is true; the second line is a situation in which A is true and B is false. The premise and conclusion columns evaluate the various statements in each of these possible situations. The

column under "A ∨ B" merely gives the standard "definition" of disjunction. The column under "¬ A" gives the negation of A in each situation. Since A is T(rue) in the first two situations and F(alse) in the second two, its negation will be the opposite—F(alse) in the first two rows, T(rue) in the second two. Finally, in this simple example, the conclusion is itself a simple statement, so we merely repeat the initial assignment of B in each of the four situations.

Because a truth table displays all possible initial assignments of truth values to simple statements contained in an argument and allows comparison of all premises with the conclusion, we can use it as a test of *validity* for arguments. You will recall that an argument is *valid* if it is *impossible* for all the premises to be *true* and the conclusion *false*. We can apply this account to arguments by asking whether there is a possible initial assignment of truth values to simple statements such that all the premises are T(rue) and the conclusion is F(alse). If there is no such counterexample, then the argument is *valid*.

In Example 5.5, there are only four possible situations, and we can examine each possibility in turn. In the first situation—row 1 where both A and B are T(rue)—the premise A ∨ B is T(rue) but premise ¬ A is F(alse). Since not all the premises are T(rue), this could not be a possible case in which all the premises are true and the conclusion is false.

Similarly, in row 2 where A is T(rue) and B is F(alse), again ¬ A is F(alse), so not all the premises are true. In row 3 where A is F(alse) and B is T(rue), however, the premise A ∨ B and the premise ¬ A are both T(rue), but in this possible case, the conclusion B is also T(rue). So here again, we satisfy the requirements for validity. Finally, in row 4 with the initial assignment of F(alse) to both A and B, we have the premise A ∨ B is F(alse); hence not all premises are true, so again examination shows that we don't have a possible situation in which all the premises are true and the conclusion is false.

We have examined all possible situations (that is, all possible initial assignments of truth or falsity, T or F, to the simple statements that make up the argument). We have found no counterexample in which all the premises are true and the conclusion is false. (Alternatively, we could say that in every case in which the conclusion is false, at least one of the premises is false.) When this occurs, we declare the argument to be *valid*.[5]

Notice that, given this account of *validity,* the only cases that could show that the argument was not valid are those in which all premises are true. If one or more premises is false for a given possible situation—that is, for a row in the truth table—then it makes no difference whether the conclusion is true or false on that line, because it could not be a case in which all the premises are true and the

5. To be more precise, the argument is *deductively valid*. Note as well that an argument might fail this test and still be deductively valid. As we will see below, some deductively valid arguments have a form that cannot be completely represented in terms of statement letters, negation, conjunction, disjunction, conditional, and biconditional.

conclusion is *false.* So, to use the truth table method as a test of validity, you need only construct the table and examine the rows in which all the premises are true. The argument is valid if, for each such case, the conclusion is also true.[6] If we find even one line in which all premises are true and the conclusion is *false,* we have found a counterexample (to the claim that the argument is valid).

Consider the following *invalid* argument and its formalization:

***Example 5.6***

| | |
|---|---|
| *(1) If I'm in Aspen, then I'm in Colorado.* | *(1)* $A \rightarrow B$ |
| *(2) I'm not in Aspen.* | *(2)* $\neg A$ |
| $\therefore$ *I'm not in Colorado.* | $\therefore \neg B$ |

We can construct the following truth table:

| | ***Initial Assignments*** | | ***Premises*** | | ***Conclusion*** |
|---|---|---|---|---|---|
| | $A$ | $B$ | $A \rightarrow B$ | $\neg A$ | $\neg B$ |
| 1 | T | T | T | F | F |
| 2 | T | F | F | F | T |
| 3 | F | T | T | T | F |
| 4 | F | F | T | T | T |

**Counterexample: situation where all the premises are true but the conclusion is false.**

Given this truth table, the only rows that we need to examine to apply the test for validity are rows 3 and 4. These are the only possible situations in which all the premises are true. In this example, row 3, where A is false and B is true, has all premises true, but the conclusion, ¬ B, is false. So here we have an instance in which there is a possible initial assignment of truth values to the simple statements such that, given the definitions of the *logical connectives* involved, the premise statements are both true but the conclusion is false. Thus the structure of the argument (as given by the logical connectives) does not guarantee that if the premises are all true the conclusion is also. It makes no difference that row 4 has both premises true and the conclusion also true. Even in an invalid argument there can be situations in which all the premises and the conclusion are true, as in row 4 of this example. But this argument form does not guarantee that this happens, as row 3 shows. In a valid argument, situations such as that in row 3 do not occur; truth of premises guarantees truth of the conclusion.

The truth table method can be extended to arguments that contain more than two simple statements. With each additional statement letter, we double the number of rows in our truth table.

---

6. In the strange case in which there are no rows where all the premises are true, we say that the premises are *inconsistent* (that is, there is no possible case in which they are jointly true). However, arguments with such an inconsistent set of premises are said to be *valid* because there will be no case in which all the premises are true and the conclusion is false simply as a consequence of there being no case in which all the premises are true.

| | |
|---|---|
| one letter | 2 rows |
| two letters | 4 rows |
| three letters | 8 rows |
| four letters | 16 rows |
| and so on | |

The test for validity can easily be extended to such arguments. Consider an argument of the following form:

***Example 5.7***

*(1)* $A \rightarrow B$

*(2)* $B \rightarrow C$

*(3)* $\neg C$

$\therefore \neg A$

The argument generates this truth table:[7]

| | ***Initial Assignments*** | | | ***Premises*** | | | ***Conclusion*** |
|---|---|---|---|---|---|---|---|
| | $A$ | $B$ | $C$ | $A \rightarrow B$ | $B \rightarrow C$ | $\neg C$ | $\neg A$ |
| 1 | T | T | T | T | T | F | F |
| 2 | T | T | F | T | F | T | F |
| 3 | T | F | T | F | T | F | F |
| 4 | T | F | F | F | T | T | F |
| 5 | F | T | T | T | T | F | T |
| 6 | F | T | F | T | F | T | T |
| 7 | F | F | T | T | T | F | T |
| 8 | F | F | F | T | T | T | T |

**All premises true but conclusion also true**

This truth table shows that the argument is valid. Only in row 8 are all three premises true, but in this case the conclusion is also true. The form of the argument guarantees that, if all premises are true, the conclusion is true as well.

The truth table method illustrated here provides a useful way of testing an argument whose validity depends on the logical structure generated by negation, conjunction, disjunction, the conditional, and the biconditional as long as only a

7. Note that a simple way of getting the eight possible cases is to repeat the four possibilities for the two letters *B* and *C*. We have these four situations when *A* is true and again when *A* is false. If we had a four-letter argument, we could generate the sixteen possible situations by including the eight we have in this example, when this fourth statement is true and again when it is false, giving us the requisite sixteen lines for a table with four simple statements. Each time we add a letter we double the number of rows needed in the truth table.

few simple statements are involved. It becomes ungainly if we have more than four or five different simple statements. For this reason, more general proof techniques are used in such cases. We will give you the flavor of these methods in another section of this chapter. Nevertheless, many commonly encountered arguments can be formalized and tested for validity using simple truth table methods. As we will see in the next section, however, some arguments that fail the truth table test can still be considered *valid*. To show their validity we need to look at logical structure in a more fine-grained way. Logical form, as we have considered it so far, consists of rather coarse relations between statements. We have simple statements, and compound statements built up of them. Consider the following argument:

***Example 5.8***

*(1) All pigs are beings having a four-chambered heart.*

*(2) Mike is a pig.*

---

*∴ Mike is a being having a four-chambered heart.*

If we try to represent this argument using the methods discussed so far, we would have to assign a single, separate statement letter to each premise and the conclusion. It would have the form

*(1) A*

*(2) B*

---

*∴ C*

and the truth table

| | ***Initial Assignments*** | | | ***Premises*** | | ***Conclusion*** | |
|---|---|---|---|---|---|---|---|
| | *A* | *B* | *C* | *A* | *B* | *C* | |
| 1 | T | T | T | T | T | T | |
| 2 | T | T | F | T | T | F | ← **Conterexample: both premises are true but the conclusion is false.** |
| 3 | T | F | T | T | F | T | |
| 4 | T | F | F | T | F | F | |
| 5 | F | T | T | F | T | T | |
| 6 | F | T | F | F | T | F | |
| 7 | F | F | T | F | F | T | |
| 8 | F | F | F | F | F | F | |

As indicated by row 2, it is possible for an argument of this form to have both premises true and the conclusion false. This is just what we would expect. There need not be any logical relation between the three separate sentences. Nevertheless, there is another way of representing logical form that, so to speak, goes inside the simple statements to represent their internal structure. We have already seen this structure in our list of successful argument patterns. Example 5.8 is an instance of Predicate Instantiation, pattern (vi).

*(1) All $P_1$'s are $P_2$'s.*

*(2) m is a $P_1$.*

*∴ m is a $P_2$.*

We will discuss techniques appropriate to arguments such as these in the next section.

## Exercise 5.3 Truth Tables

1. Complete the truth tables for the remaining two if-then argument patterns from our chart. Note that when three separate statements (A, B, C) are used to construct the premises and conclusion, there are eight possible situations represented by combinations of truth and falsity of these statements. Use the same interpretation of if-then as we used in the example above—that is, a statement of this form will be taken to be false only when the "if" part is true and the "then" part is false.

a.

| ***Initial Assignments*** | | ***Premises*** | | ***Conclusion*** |
|---|---|---|---|---|
| $A$ | $B$ | $A \rightarrow B$ | $\neg B$ | $\neg A$ |
| T | T | | | |
| T | F | | | |
| F | T | | | |
| F | F | | | |

b.

| ***Initial Assignments*** | | | ***Premises*** | | | ***Conclusion*** |
|---|---|---|---|---|---|---|
| $A$ | $B$ | $C$ | $A \rightarrow B$ | $B \rightarrow C$ | $A$ | $C$ |
| T | T | T | | | | |
| T | T | F | | | | |
| T | F | T | | | | |
| T | F | F | | | | |
| F | T | T | | | | |
| F | T | F | | | | |
| F | F | T | | | | |
| F | F | F | | | | |

2. Complete the following truth tables for invalid argument patterns. Note which rows indicate a case in which the premises are all true but the conclusion is false.

a.

| ***Initial Assignments*** | | ***Premises*** | | ***Conclusion*** |
|---|---|---|---|---|
| $A$ | $B$ | $\neg A \rightarrow B$ | $A$ | $B$ |
| T | T | | | |
| T | F | | | |
| F | T | | | |
| F | F | | | |

b.

| ***Initial Assignments*** | | | ***Premises*** | | | ***Conclusion*** |
|---|---|---|---|---|---|---|
| $A$ | $B$ | $C$ | $A \rightarrow B$ | $B \rightarrow C$ | $\neg A$ | $C$ |
| T | T | T | | | | |
| T | T | F | | | | |
| T | F | T | | | | |
| T | F | F | | | | |
| F | T | T | | | | |
| F | T | F | | | | |
| F | F | T | | | | |
| F | F | F | | | | |

3. Create truth tables for determining whether the following argument patterns are valid.

a. *(1) If A, then not B.*
*(2) B.*
*∴ Not A.*

b. *(1) If A, then not B.*
*(2) Not B.*
*∴ Not A.*

c. *(1) If A, then B.*
*∴ If B, then A.*

d. *(1) If A, then B.*
*∴ If not B, then not A.*

e. *(1) Either A or B.*
*∴ If not A, then B.*

f. *(1) Either A or B.*
*∴ If not B, then A.*

g. *(1) Either A or B.*
*(2) If B, then C.*
*∴ If not A, then C.*

h. *(1) If not A, then B.*
*(2) If C, then B.*
*∴ If not A, then C.*

i. *(1) If A, then not B.*
*(2) Either not B or C.*
*(3) A.*
*∴ C.*

j. *(1) If A, then not B.*
*(2) Either C or B.*
*(3) A.*
*∴ C.*

k. *(1) If A and B, then C.*
*(2) A and B.*
*∴ C.*

l. *(1) If A, then B or C.*
*(2) A and not B.*
*∴ C.*

m. *(1) A if and only if B.*
*(2) If B, then C.*
*(3) Not C.*
*∴ A.*

n. *(1) (Not A) or B.*
*(2) (Not B) or C.*
*(3) Not C.*
*∴ Not A.*

## Representing Structures Within Statements: Predicates and Quantifiers

In previous sections we explored the way the concept of *validity* could be made precise for arguments that could be formalized in terms of statement letters and logical connectives. Our aim in this section is to look more closely at logical form by examining arguments whose validity depends on structure within statements. We have represented statements such as *Mike is a pig* as having the structure *m is a P*. We could represent it even more simply as *Pm,* where the letter *P* stands for the predicate "is a pig," which is combined with the letter *m*, which stands for "Mike," to form a complete statement. Similarly, if we represent *Mike is a being having a four-chambered heart* by *Hm*, *H* stands for the predicate and *m* for the name that is the subject of the statement.

The aspect of logical form that generates validity depends on more than the simple relationship between a named individual and some characteristic represented by a letter standing for a predicate. In particular, these arguments depend on logical words such as *all*, *no,* or *some,* which indicate the "quantity" of individuals having the characteristic. For this reason, we will refer to words such as these as *quantifiers.* In a later section, we will also use this expression to refer to symbols that can take the place of these words. In this section, we will represent statements such as *All pigs are beings having a four-chambered heart* as having the structure *All A's are B's.*[8]

**Testing Validity of Arguments Containing Quantifiers** Although the straightforward methods of the truth table do not extend to arguments containing quantifiers, simple forms of these arguments can be checked using another tool. Consider the valid "predicate-based" argument patterns—(vi) and (vii) from the chart Some Common Successful Argument Patterns given in chapters 2 and 4.

***Example 5.9***

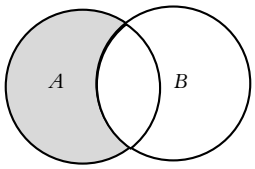
**vi.** ***Predicate Instantiation***

*(1) All A's are B's.*
*(2) m is an A.* (or *Am*)
*∴ m is a B.* (or *Bm*)

**vii.** ***Universal Syllogism***

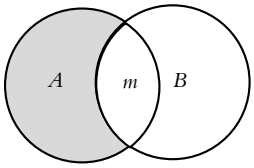
*(1) All A's are B's.*
*(2) All B's are C's.*
*∴ All A's are C's.*

As we showed in chapter 4, we can capture the structure of a statement such as *All A's are B's* using a Venn diagram. The shading indicates that this part of the A circle is empty. No A's lie in this part of the circle. The only place where an instance of A can lie is in the overlap between the A circle and the B circle. In other words, all A's are also B's.

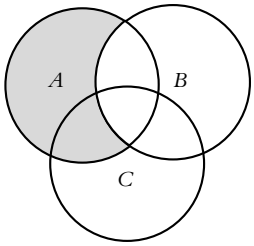



Placing an *m* inside the nonshaded portion of A indicates that some instance, *m*, is an A. This represents the second premise of the Predicate Instantiation argument. By inspection we can see that this instance *must* also be a B, which is the conclusion of the argument.

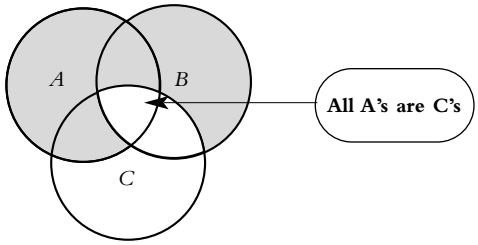
8. We will use letters without subscripts, *All A's are B's,* in place of *All $P_1$'s are $P_2$'s*, in this chapter to indicate predicates. When translating, we will pick letters from the English sentence to remind us which elements of our formalism correspond to what part of the sentences they represent.




We can extend this method of representation to pattern (vii), Universal Syllogism. We represent *All A's are B's* as before, but we can add a third, overlapping circle to indicate the class of C's.




We shade a portion of the B circle, representing *All B's are C's*, and we see that our conclusion follows—*All A's are C's* (the only nonshaded or white area in A is also in C).




Contrast these cases to two invalid argument patterns and their corresponding Venn diagrams.

***Example 5.10*** ***Venn Diagram for Invalid Argument Patterns***

**(i)** ***Argument Pattern*** ***Venn Diagram***

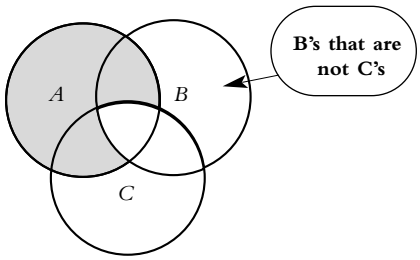
Invalid

*(1) All A's are B's.*

*(2) All A's are C's.*

---

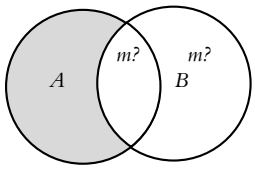
*∴ All B's are C's.*



**(ii)** ***Argument Pattern*** ***Venn Diagram***

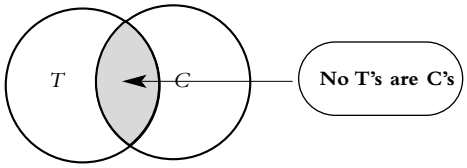
Invalid

*(1) All A's are B's.*
*(2) m is a B.*
*∴ m is an A.*




Again we can look for a counterexample. We construct the Venn diagrams to make the premises true. We can then ask whether the conclusion must be true. If it is possible for the conclusion to be false, then the argument is not valid. The possibility of objects that are B but not C as indicated by the upper unshaded portion of the Venn diagram in Example 5.10(i) shows that its conclusion can be false according to the Venn diagram even though the premises are all true. It serves as a counterexample. No valid argument can admit this possibility, so this one must be *invalid*. Similarly, the possibility that the named object *m* might be in the right-hand portion of the Venn diagram (ii) serves as a counterexample that demonstrates that this argument is invalid as well.

The method can be extended to testing related arguments using the "logical" word *no* and related terms. For instance, *No clinically tested substance is a cure for AIDS*, which exhibits the pattern *No T's are C's*, is represented by the Venn diagram that darkens the overlap in the circles

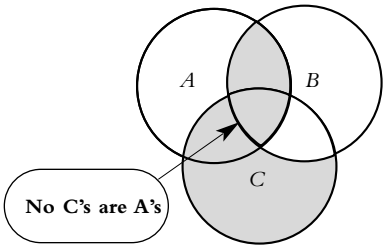



Notice that this is the same Venn diagram you would use for statements of the form *All T's are not C's.* Indeed, we can easily combine Venn diagrams for many statements containing *no* and *not* with those containing *all*.

***Example 5.11*** **(i)** ***Argument Pattern*** ***Venn Diagram***

Valid

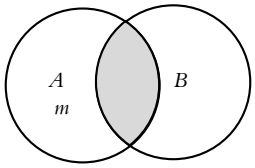
*(1) No A's are B's.*
*(2) All C's are B's.*
*∴ No C's are A's.*



**(ii)** ***Argument Pattern*** ***Venn Diagram***

Valid

*(1) No A's are B's.*
*(2) m is an A.*
*∴ m is not a B.*

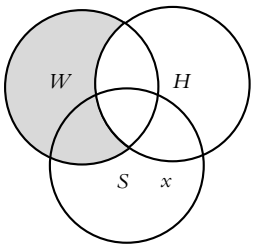



Finally, we can expand the method of representation we used for statements about some named individual to the more general case in which we are talking about some unnamed individual in statements such as *Some savings and loan presidents are not honest* in Example 5.12.

***Example 5.12***

*(1) All people worthy of respect are honest.* — *All W's are H's.*
*(2) Some savings and loan presidents are not honest.* — *Some S's are not H's.*
*∴ Some savings and loan presidents are not worthy of respect.* — *∴ Some S's are not W's.*

Valid

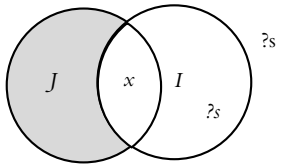



In Example 5.12 the second premise assures us that there is at least one entity—call it *x*—that is in the S circle but not in the H circle. But as we can directly see, this means that there is at least one individual in the S circle that is not in the W circle. So we can see that it is impossible for both the premises to be true and the conclusion to be false. By contrast, in Example 5.13 the two premises can be true, as indicated by the *x* in the intersection and the letter *s* in the right circle as well as outside either circle. We don't know whether it is inside or outside the right circle from the information supplied in premise 2. But we aren't assured that the named individual is *not* in the right circle. Hence, it is possible for the premises to be true without the conclusion being true. This provides a counterexample that indicates the argument is invalid.

***Example 5.13***

| | |
|---|---|
| *(1) Some journalists are intelligent.* | *(1) Some J's are I's.* |
| *(2) Stephen Hawking is not a journalist.* | *(2) s is not a J. (or ¬ Js)* |
| *∴ Stephen Hawking is not intelligent.* | *∴ s is not an I. (or ¬ Is)* |

Invalid




## (Optional) A More Formal Way of Representing Statements with Quantifiers

We have extended our formalism by using terms like *Pm* for the statement *Mike is a pig* and ¬ Js for *Stephen Hawking is not a journalist*. We can extend it to quantifiers as well. A statement such as *All pigs are beings having a four-chambered heart,* which we represented as having the structure *All $P_1$'s are $P_2$'s,* can be reformulated as *For all things, if it is a pig, then it is a being having a four-chambered heart*. This allows us to introduce the symbol (*x*) as meaning "*For all things.*" With this symbolism we can then represent the structure within the sentence

*All pigs are beings having a four-chambered heart.*

as

*(x) (Px → Hx).*

Given this formalism, we can represent the argument given in Example 5.8 as

***Example 5.14***

| | |
|---|---|
| *(1) All pigs are beings having a four-chambered heart.* | *(1) (x) (Px → Hx)* |
| *(2) Mike is a pig.* | *(2) Pm* |
| *∴ Mike is a being having a four-chambered heart.* | *∴ Hm* |

Similarly, we can represent the more complicated argument using this formalism:

***Example 5.15***

| | |
|---|---|
| *(1) All pigs are mammals.* | *(1) (x) (Px → Mx)* |
| *(2) Every mammal is a being having a four-chambered heart.* | *(2) (x) (Mx → Hx)* |
| *∴ All pigs are beings having a four-chambered heart.* | *∴ (x) (Px → Hx)* |

Thus far, the formalism using the quantifier (*x*) helps us capture the logical structure of statements containing logical words such as *all* and *every.* We can also use it to represent statements such as *No clinically tested substance is a cure for AIDS.* We can see the appropriate way to use this symbol if we realize that this statement can be rewritten as *For all things, if it is a clinically tested substance, then it is not a cure for AIDS.* So the sentence can be formalized as *(x) (Tx → ¬ Cx),* where *Tx* stands for *It is a clinically tested substance* and *Cx* stands for *It is not a cure for AIDS.* This suggests the following formalization:

***Example 5.16***

| | |
|---|---|
| *(1) No clinically tested substance is a cure for AIDS.* | *(1) (x)( Tx → ¬ Cx)* |
| *(2) AZT is a clinically tested substance.* | *(2) Ta* |
| *∴ AZT is not a cure for AIDS.* | *∴ ¬ Ca* |

Finally, we can use another symbol to represent one more logical word important in representing argument structure. Consider the statements *Some politicians are corrupt* and *Some politicians are not corrupt.* There is no translation into statements involving *all* or *no.* We need a separate symbol (∃*x*) meaning *There exists at least one thing that . . .* , so that *Some politicians are corrupt*—that is, "There exists at least one thing that is a politician and corrupt"— can be represented as *(∃x)(Px & Cx)* and *Some politicians are not corrupt* can be represented as *(∃x)(Px & ¬ Cx).*[9] With this symbolism in hand, we can translate arguments as follows:

***Example 5.17***

| | |
|---|---|
| *(1) All people worthy of respect are honest.* | *(1) (x)(Wx → Hx)* |
| *(2) Some politicians are not honest.* | *(2) (∃x)(Px & ¬ Hx)* |
| *∴ Some politicians are not worthy of respect.* | *∴ (∃x)(Px & ¬ Wx)* |

9. The quantifier *(x),* sometimes written (∀*x*), is called the *universal* quantifier—it applies to all or every item in our universe of interpretation. The quantifier (∃*x*) is called the *existential* quantifier—it asserts the existence of some (at least one) entity in the universe having a certain characteristic.

## Exercise 5.4 Venn Diagrams

Give an example in English of an argument having each of the following patterns. Construct Venn diagrams to test for the validity of the patterns. If you studied the optional last section of this chapter, translate each argument into our formalism using quantifiers.

1. a. *(1) All A's are B's.*
   *(2) All C's are B's.*
   ---
   *∴ All A's are C's.*

   b. *(1) All A's are B's.*
   *(2) m is not a B.*
   ---
   *∴ m is not an A.*

   c. *(1) All A's are B's.*
   *(2) All B's are C's.*
   *(3) m is an A.*
   ---
   *∴ m is a C.*

   d. *(1) All A's are B's.*
   *(2) All B's are C's.*
   *(3) m is a C.*
   ---
   *∴ m is an A.*

   e. *(1) All A's are B's.*
   *(2) All C's are B's.*
   *(3) m is not an A.*
   ---
   *∴ m is not a C.*

   f. *(1) All A's are B's.*
   *(2) All C's are B's.*
   *(3) m is not a B.*
   ---
   *∴ m is not an A and m is not a C.*

2. a. *(1) No A's are B's.*
   *(2) All C's are B's.*
   ---
   *∴ No A's are C's.*

   b. *(1) No A's are B's.*
   *(2) No C's are B's.*
   ---
   *∴ No A's are C's.*

   c. *(1) No A's are B's.*
   *(2) No B's are C's.*
   ---
   *∴ No A's are C's.*

   d. *(1) No A's are B's.*
   *(2) m is a B.*
   ---
   *∴ m is not an A.*

e. *(1) No A's are B's.*
*(2) All C's are B's.*
*(3) m is a C.*
*∴ m is not an A.*

f. *(1) No A's are B's.*
*(2) All B's are C's.*
*(3) m is a C.*
*∴ m is not an A.*

3. a. *(1) All A's are B's.*
*(2) Some C's are A's.*
*∴ Some C's are B's.*

b. *(1) All A's are B's.*
*(2) Some C's are B's.*
*∴ Some C's are A's.*

c. *(1) All A's are B's.*
*(2) Some C's are not A's.*
*∴ Some C's are not B's.*

d. *(1) Some A's are B's.*
*(2) Some C's are B's.*
*∴ Some A's are C's.*

e. *(1) No A's are B's.*
*(2) Some C's are A's.*
*∴ Some C's are not B's.*

f. *(1) No A's are B's.*
*(2) All B's are C's.*
*∴ Some C's are not A's.*

## Glimpses Beyond: Natural Deduction

Although truth tables and Venn diagrams serve to characterize *validity* for a variety of simple arguments encountered in everyday deductive reasoning, they are cumbersome techniques to use when arguments become complex. To handle these more complex cases, logicians have formulated a variety of systems of rules, which, if followed, allow us to say the conclusion follows from the premises. These systems of rules can themselves be shown to be justified.

The oldest of these systems of rules was given initial impetus by Aristotle in the fourth century B.C. His rules concerned the *syllogism,* a simple three-predicate argument of the type we examined in the previous section. The rules of the syllogism allow us to determine which of the combinations produce valid arguments. More recently, a variety of "natural deduction" systems have been developed that are roughly based on rules that human reasoners might *naturally* follow. One such rule might be a generalized form of *modus ponens.* Let us call a chain of reasoning in accordance with a set of rules for natural deduction a *proof.*

***MODUS PONENS* RULE**
**In a proof, if □ is justified and □→ Δ is justified, then Δ is justified.**[10]

This rule would allow us to carry out the following proof, which consists of a series of lines that begins with a set of premises (above the line) followed by a series of "conclusions" that follow from the premises. Each line is *justified* either as a *premise* or as *following from previous lines according to a rule of deduction*.

***Example 5.18***

| | *JUSTIFICATION* |
|---|---|
| *(1) A & B* | *premise* |
| *(2) (A & B) → (C ∨ D)* | *premise* |
| *(3) (C ∨ D) → E* | *premise* |
| *(4) E → F* | *premise* |
| ∴ *(5) (C ∨ D)* | *(1)(2) modus ponens*[11] |
| ∴ *(6) E* | *(5)(3) modus ponens* |
| ∴ *(7) F* | *(6)(4) modus ponens* |

We might add other rules. For example, we might have a conjunction rule that allowed us to join two separate lines and get a conjunction.

**CONJUNCTION RULE**
**In a proof, if □ is justified and Δ is justified, then □ & Δ is justified.**

This allows simple *proofs* such as:

***Example 5.19***

| | *JUSTIFICATION* |
|---|---|
| *(1) A* | *premise* |
| *(2) B* | *premise* |
| ∴ *(3) A & B* | *(1)(2) conjunction* |

as well as more complicated proofs:

***Example 5.20***

| | *JUSTIFICATION* |
|---|---|
| *(1) A* | *premise* |
| *(2) B* | *premise* |
| *(3) (A & B) → C* | *premise* |
| *(4) D* | *premise* |
| *(5) (C & D) → E* | *premise* |
| ∴ *(6) A & B* | *(1)(2) conjunction* |
| ∴ *(7) C* | *(6)(3) modus ponens* |
| ∴ *(8) C & D* | *(7)(4) conjunction* |
| ∴ *(9) E* | *(8)(5) modus ponens* |

10. The symbols □ and Δ stand for any expression in our formal language no matter how complex.
11. In this illustration, the numbers indicate the line numbers of statements previously given in the proof from which the current line follows in accordance with listed rules. We have only introduced one such rule, *modus ponens.*

Natural deduction systems come in a number of varieties, differing in the particular rules they take as most basic. Furthermore, the two simple rules we have introduced deal only with whole statements. Additional rules might be used to handle quantifiers. For instance, we could have a rule allowing us to go from the negation of a universally quantified statement to an existentially quantified statement.

**QUANTIFIER INTERCHANGE RULE**
**In a proof, if $\neg (x) \square$ is justified, then $(\exists x) \neg \square$ is justified.**

This could be used in the following proof:

***Example 5.21***

| | *JUSTIFICATION* |
|---|---|
| *(1)* $(x) Px$ | *premise* |
| *(2)* $(x) Px \rightarrow \neg (x)Qx$ | *premise* |
| *(3)* $(\exists x) \neg Qx \rightarrow (\exists x) \neg Rx$ | *premise* |
| $\therefore$ *(4)* $\neg (x)Qx$ | *(1)(2) modus ponens* |
| $\therefore$ *(5)* $(\exists x) \neg Qx$ | *(4) quantifier interchange* |
| $\therefore$ *(6)* $(\exists x) \neg Rx$ | *(5)(3) modus ponens* |

A full set of rules for natural deduction is beyond the scope of this chapter. Many of the details are especially relevant only to those interested in logic or mathematics. But you should note that, even in everyday contexts, loose types of proofs are given to establish that a conclusion is actually supported by premises.

***Example 5.22***

*Given political realities, taxes aren't going to be raised significantly in the near future. So an extensive medical care plan will be delayed. Consequently, many Americans will be left without medical insurance.*

We can represent the three sentences in this passage as follows:

*T: Taxes aren't going to be raised significantly in the near future.*
*P: An extensive medical care plan will be delayed.*
*M: Many Americans will be left without medical insurance.*

The proof is:

***Example 5.23***

| | *JUSTIFICATION* |
|---|---|
| *(1)* $T$ | *premise* |
| *(2)* $T \rightarrow P$ | *premise (implicit)* |
| *(3)* $P \rightarrow M$ | *premise (implicit)* |
| $\therefore$ *(4)* $P$ | *(1)(2) modus ponens* |
| $\therefore$ *(5)* $M$ | *(4)(3) modus ponens* |

Notice that both of the conclusions, including the subordinate conclusion in line 4, are explicitly mentioned in the passage. What is left out are the obvious

conditions 2 and 3. It is useful in interpreting arguments to keep in mind that some of the intermediate steps employed in reaching a final conclusion are often included to guide the reader or listener from premises to ultimate conclusion. The *modus ponens* (or chain) rule is used in *direct* proofs to spin out the implications of a set of premises. Another more *indirect* tactic is sometimes employed. Instead of trying to directly establish a conclusion, it is sometimes more effective to examine its denial. If this denial leads to an unacceptable (absurd) result, then the original statement can be embraced. This method of indirect proof is sometimes called *reductio ad absurdum* or just *reductio.*

**RULE OF INDIRECT PROOF *(reductio ad absurdum)***
**In a proof, if adding □ to a set of justified assertions leads to a contradiction (Δ & ¬ Δ), then ¬ □ is justified.**

***Example 5.24***

*It can't be that our perceptions represent things as they really are. I perceive this stick in water as bent. I perceive this stick out of water as not bent. Suppose that things really are as we perceive them. Then the same stick would be both bent and not bent.*

We can represent the simple statements in this passage as follows.

*W: I perceive this stick in water as bent.*
*O: I perceive this stick out of water as not bent.*
*R: Things really are as we perceive them.*
*B: This stick is bent.*

The proof is:

***Example 5.25***

| | *JUSTIFICATION* |
|---|---|
| *(1) W* | *premise* |
| *(2) O* | *premise* |
| *(3) R → (W → B)* | *premise (implicit)* |
| *(4) R → (O → ¬ B)* | *premise (implicit)* |
| *(5) R* | *ASSUMPTION* |
| *(6) W → B* | *(3)(5) modus ponens* |
| *(7) O → ¬ B* | *(4)(5) modus ponens* |
| *(8) B* | *(1)(6) modus ponens* |
| *(9) ¬ B* | *(3)(5) modus ponens* |
| *(10) B & ¬ B* | *(8)(9) conjunction* |
| *(11) ¬ R* | *(5)(10) indirect proof (reductio)* |

Here again, the comments in the passage present elements in the proof rather than a straightforward statement of premises. Recognizing this as a fairly common

strategy might help you reconstruct the arguments of others and shape or edit your own arguments.

We have only touched on the issues that would be raised in a full-fledged presentation of a natural deduction system. Such a presentation would provide a systematic account of deductive validity that can handle all of the argument types we have considered in this chapter, as well as more that we have not explored.

CHAPTER SIX

# *Fallacies: Bad Arguments That Tend to Persuade*

A *fallacy* is a bad argument that tends to persuade us even though it is faulty. In this chapter we look at twelve common fallacies. We examine why each is a bad argument and also why it nevertheless tends to persuade us. All except one are bad arguments either because of having a false premise or because the conclusion doesn't follow from the premises. They are persuasive for a variety of reasons. We focus on the elements of distraction, of resemblance to good arguments, and of confusion of emotion with reason.

## Persuasiveness

Fallacies tend to persuade us, but so do good arguments. Before we look at how fallacies persuade us in *illegitimate* ways, we should try to understand by contrast the *legitimate* ways in which good arguments persuade us. To be persuasive, a good argument must go beyond merely presenting true premises and a conclusion that follows. A fully successful argument must also have premises that an audience will understand and believe and a structure that enables the audience to see that the conclusion follows. It does no good to present true premises if the audience can't understand them or won't believe them. Nor does it do any good to present an argument whose structure is so complicated that the audience can't see that the conclusion follows. Being convincing to an audience, in this legitimate sense of making the audience realize that the conclusion follows from premises that the audience accepts, can be added to the criteria for a fully successful deductive argument (Table 6.1).

**Table 6.1**

| *Criteria* | *Terms Used for Success in Satisfying Criteria* | |
|---|---|---|
| 1. Structural design | Validity | Soundness; Successfulness |
| 2. Foundation | Truth of Premises | Soundness; Successfulness |
| 3. Convincing an audience | (Legitimate) Persuasiveness | Successfulness |

By contrast, if an argument is illegitimately persuasive, then it inclines an audience to accept its conclusion for reasons unrelated to its deserving belief. For example, an argument can be presented so that your attention is drawn away from a weak premise, toward premises you are inclined to accept. Another way an argument could persuade you is by making you *want* to believe its conclusion even though it is not deserving of belief. We will see how an argument might accomplish this as we explore fallacies that confuse reason and emotion.

The tricks and gimmicks some arguments employ can persuade not only the audience but also the person presenting the argument. In explaining how certain common fallacies might tend to persuade you, we are trying to enable you to do two things. First, you can be on the alert against either committing these kinds of fallacies yourself or against accepting them when they are presented by others. Second, you can learn to explain to people who commit a fallacy why they might have thought they were offering a good argument when they were not. It is for this latter purpose that we place considerable emphasis on why the fallacies tend to persuade us.

## What Is a Fallacy?

Not all invalid or unsound arguments are fallacies. Some writers do not distinguish between unsound and fallacious arguments. However, lumping these categories together ignores the aspect of potential trickery or deceit that is present in fallacies but not in all unsound reasoning. If someone were so misguided in her reasoning as to tell you that you should buy either a car or a motorcycle, therefore you should buy both, her argument would obviously be unsound; but since nothing in this kind of argument tempts us to be persuaded, it is not a fallacy. If, on the other hand, we are told that the streets in our town should not be repaved because a member of the city council who argued for the repaving has a financial interest

in the cement industry, we are not hearing sound reasoning, but there *is* a tendency for arguments like this to persuade us. Hence it is a fallacy. Although there is an element of trickery in fallacies, not everyone who offers a fallacious argument intends to trick or deceive; arguers may be deceived by their own reasoning.

*Fallacies, then, are arguments that tend to persuade but should not persuade.* Of course, we will not call a bad argument a fallacy just because it happens to persuade some unwary person. There must be a common tendency for an argument of a certain kind to persuade people, even though they should not be persuaded, before we call the argument a fallacy. Examining a series of common fallacies will provide you with a checklist of ways a faulty argument might seem persuasive.

## Categorizing the Fallacies According to Their Sources of Persuasiveness

We can avoid and explain fallacies more easily if we divide them into categories according to the kinds of tricks they use. There are three primary ways an argument can trick you. First, an argument can trick you by distracting your attention away from the weak point of the argument, just as a sleight-of-hand artist (a magician) distracts you so you don't see the false move. Second, an argument can appear to be sound because of a counterfeit resemblance to an argument that really is sound. This is also a trick that a magician uses substituting props or dummies for the real thing. Third, an argument can persuade you by confusing emotion with reason. We will describe three *distraction* fallacies, four *resemblance* fallacies, three *emotion* fallacies, and two fallacies that persuade by means of a combination of emotion and resemblance.

A difficulty in presenting a discussion of fallacies should be understood before we begin. As we introduce each kind of fallacy, we need to state an example that shows clearly the flaw in this kind of argument. But if the flaw is made obvious, you may doubt that this kind of argument will ever fool you. So our clear, illustrative examples may make you feel it unnecessary to take the study of fallacies seriously. It is important, however, to overcome this temptation. Although the flaws will be obvious in many of the examples we present, there is a trick or ploy involved in each kind of fallacy that *can* be effective. It is as though, by seeing sleight-of-hand artists work slowly, watching them from the most revealing angle, you will be learning how they fool people. Such knowledge doesn't guarantee that you wouldn't be fooled by similar tricks if you were in the audience. But you would have an advantage in knowing what to look for.

## Distraction Fallacies

1. False dilemma
2. Slippery slope
3. Straw man

***False Dilemma*** This fallacy is a bad argument because it has a false premise: it presents an either-or choice when in fact there are more alternatives. It tends to persuade through the technique of distraction. Here is an example of this fallacy:

***Example 6.1*** *Either we legalize drugs or we keep building new prisons and filling them with drug offenders.*

The implicit premise, obviously, is that we should not keep building new prisons and filling them with drug offenders. This type of argument is typical of a false dilemma. *The arguer claims that there are two alternatives and that one is unacceptable, so we should choose the other. But in fact, there are more alternatives than the two stated.* We are distracted by how undesirable, or preposterous, one of the alternatives is, and we tend not to ask whether these are the *only* two alternatives. In Example 6.1 there are other alternatives. We could reduce the amount of prison time that is mandated for some or all drug offenses. We could substitute house arrest with drug testing for prison sentences. It *may* be that certain drugs should be legalized, but if this is true, it is not because the only alternative is building new prisons and filling them with drug offenders.

*(1) Either A or B.*

*(2) Not A.*

---

*∴ B.*

But if it is really a *false* dilemma argument, then it is unsound because the premise *Either A or B* is not true. Examples 6.2 to 6.4 are also examples of false dilemma. Notice that one premise and the conclusion are often left implicit. Sometimes a false dilemma is stated in the form: If we don't choose alternative A, then we will be left with the (undesirable) outcome of alternative B.

***Example 6.2*** *If we don't give people the death penalty, they will get off with a few years in prison and then parole. So we should not abolish the death penalty.*

***Example 6.3*** *Either we allow abortion or we force children to be raised by parents who don't want them.*

And, of course, there was the motto from the era of war protesters and their opponents:

***Example 6.4*** *America: Love it or leave it.*

Notice how easy it is to be distracted from the issue of whether these are the only alternatives.

***Slippery Slope*** Sometimes we object to something on the grounds that *if* it is done, *then* something else will happen or is likely to happen as a result, and *if* so, *then* something else, and then something else, right down the "slippery slope" to a situation that is clearly undesirable. This may be a good argument or it may be a fallacy depending on whether it has an unacceptable premise. When it is a fallacy, one of the if-then premises will be doubtful. Typically, we don't see that it is doubtful because our attention is drawn away from the weak premise to the bottom of the slope. For example:

***Example 6.5*** *Now they make us register handguns, then pretty soon it will be all guns. If that happens, then they'll be in a position to take our guns away. We'll be set up for a police state.*

As with false dilemma, our attention is distracted by the thought of how horrible the situation is that threatens us (according to the argument). We do not attend to the question of whether all the steps down the slippery slope are really connected. If it is doubtful that all the steps are connected, as in Example 6.5, then an argument of this sort is fallacious. Another example of the slippery slope fallacy is:

***Example 6.6*** *We must keep the classics of European thought at the core of our college curriculum. If we continue to move our curriculum in a multicultural direction, quality will be sacrificed in the name of diversity. Pretty soon we'll be treating pop music and pulp fiction as serious art.*

In Example 6.5, the conclusion of the argument is made explicit in the first sentence. When it is not, as in Example 6.6, the implicit conclusion is usually that the first step on the slope should not be taken.

***Straw Man*** The *straw man* fallacy is more complicated than false dilemma or slippery slope, but it also relies on the sleight-of-hand technique of distraction. *Straw man consists of making your own position appear strong by making the opposing position appear weaker than it actually is.* If the entire argument were presented in detail, we could identify two premises that are false: (1) the premise that inaccurately describes the opponent's position and (2) the (implicit) premise that you must either support this untenable position or support the position taken by the

speaker (typically there are other alternatives). You might think of this fallacy as a combination of misrepresenting another person's views and the false dilemma of choosing either this (weakened) position or the speaker's position. The absurdity of the opposing position is what distracts us. Some examples are:

***Example 6.7*** *Now is no time to reduce defense spending. Senator Toski claims we should spend less, but the senator apparently thinks the instability in Eastern Europe and in the Middle East pose no threat to our interests.*

***Example 6.8*** *The younger generation should be more politically involved. They must not care about the future.*

In Example 6.7 your attention is drawn to how weak the senator's argument is for reduced defense spending, and there is a strong tendency to move directly to the conclusion that we should not reduce such spending. Example 6.8 inclines us to condemn young people for a lack of concern about the future, ignoring other, better reasons they might have for avoiding political involvement. We do not stop to think that some opposing arguments are much tougher to knock down. If you are really trying to test a position you hold, you should build the *strongest* case you can in opposition to it, not the weakest.

Here is another example of the straw man fallacy:

***Example 6.9*** *We desperately need a nationalized health care program. Those who oppose it think that the private sector will take care of the needs of the poor. But this has not been the case in the past and will not be in the future.*

The fact that *this* particular argument against nationalized health care can be easily refuted is irrelevant to whether we should in fact have such a program.

Keep in mind that the person who commits the straw man fallacy cites *someone else's* argument. False dilemma is a broader category of argument. The choices in a false dilemma are not limited to points of view; they could be actions to take, objects to select, and so on. Also, straw man fallacies not only present a false either-or premise; in addition, they misrepresent the opposing view. Consider how Example 6.10 commits the more specific fallacy of straw man while Example 6.11 is a false dilemma but not a straw man fallacy.

***Example 6.10*** ***Straw man:*** *We should ban all guns. Those who oppose a ban on guns don't think very many crimes involve guns, but statistics prove otherwise.* (Arguer makes the argument look strong by citing an opposing argument that is obviously weak.)

***Example 6.11*** ***False dilemma:*** *Either we ban all guns or we let crime run amok.* (Arguer claims there are only two alternatives; one is unacceptable.)

## Exercise 6.1 Identifying Fallacies: False Dilemma, Slippery Slope, Straw Man

1. We have discussed three of the seven sleight-of-hand fallacies. You can solidify what you have learned by identifying the fallacies in the following passages and by writing a brief explanation of why each fallacy might be persuasive. There may be more than one fallacy in some passages.

   a. **Sample:** *You're either part of the solution or part of the problem.*
   Passage (a)—false dilemma—would be persuasive because the thought that you might be part of the problem distracts you from considering that there are more alternatives than these two. A third alternative is that you are *both* part of the solution and part of the problem.

   b. I'm in favor of legalized gambling. There are those who oppose it, but they apparently think that anything that's fun is sinful.

   c. If you're not going to save *a lot* of money on fuel, then you might as well not waste the effort. Putting weather stripping around your doors doesn't save you that much.

   d. In the early stages the compulsive gambler doesn't behave differently from the casual gambler. He plays a little poker on Friday night; he bets on the Sunday football games. Slowly, he begins to bet more. Winning becomes the high point of his week. A loss means several days of depression. Finally, he runs out of his own money and is forced to get it any way he can. He begs, borrows, and ultimately steals. Beware! That first flip of the coin can spell disaster.

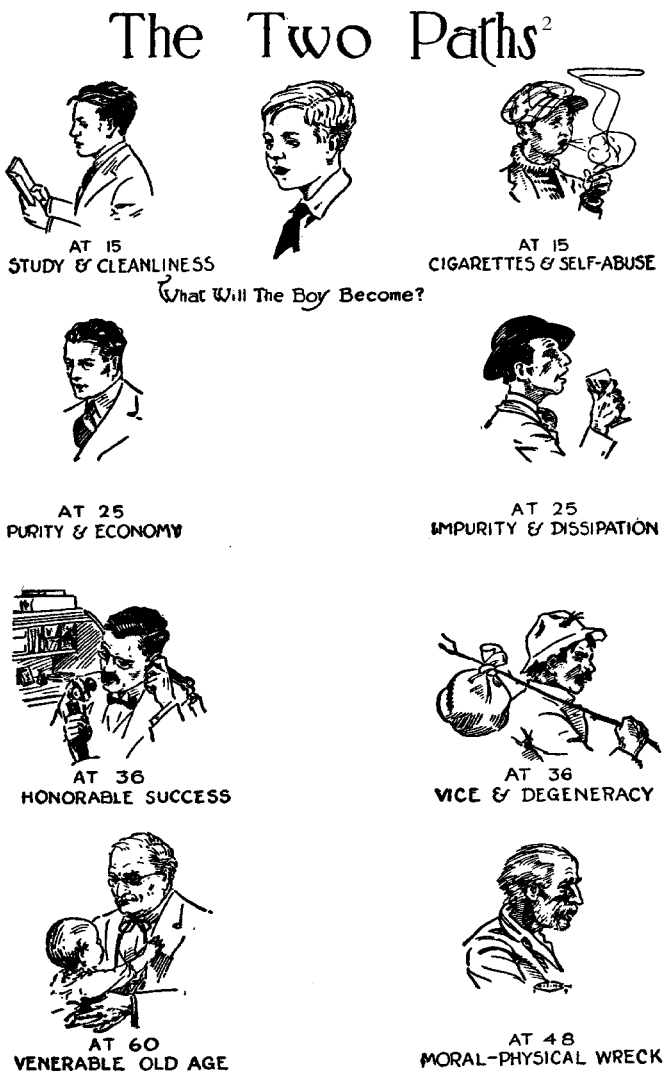
   e. The main argument for drug legalization seems to be a hedonistic one—that we're all entitled to pursue any pleasure we want, regardless of the consequences. But surely any pleasure that drugs bring is far outweighed by the harm they cause. I oppose legalization.

   f. Those who support the practice of prayer in the classroom must believe that there is no constitutional provision for separation of church and state. But such a separation is clearly provided for. Prayer in the classroom cannot be tolerated.

g.

1. B. G. Jefferis and J. L. Nichols, *Light on Dark Corners: A Complete Sexual Science and Guide to Purity* (New York: In Text Press, 1928), 43. Used by permission.

h.




2. B. G. Jefferis and J. L. Nichols, *Light on Dark Corners: A Complete Sexual Science and Guide to Purity* (New York: In Text Press, 1928), 41. Used by permission.

i. I urge you to vote against the bill requiring a deposit on all bottles. There are many kinds of litter besides bottles. We should require a deposit on everything that might be thrown on the roadside or on nothing.
j. I think it would be a mistake to retain any of our welfare programs. If we give people something, they come to expect it. And this attitude will spread to the point that everyone thinks society will support them. Pretty soon we'll be left with an ineffective socialism. There are many people who disagree with me about this who support welfare. But they seem to think that it is beneath the dignity of people on welfare to do the same kinds of menial jobs that many of us had to do.

2. Creating examples of fallacies: write one example (of your own creation) of each of the folowing fallacies: false dilemma, slippery slope, straw man.

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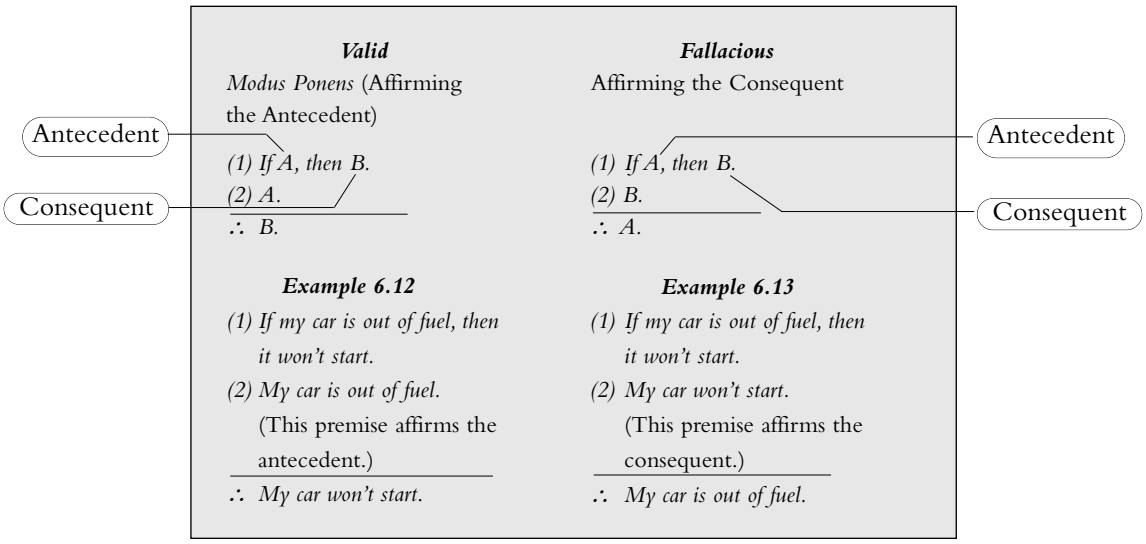
## Resemblance Fallacies

1. Affirming the consequent
2. Denying the antecedent
3. Equivocation
4. Begging the question

The second kind of trick the sleight-of-hand artist uses is to substitute props and dummies for the objects they resemble. Certain fallacies can trick you in the same way; they can seem like good arguments because they resemble good arguments. The first two fallacies are sometimes called *formal fallacies* because they have an incorrect *form* or pattern. Arguments of this kind are bad because they are invalid. Their premises might be true, but this is not enough to make an argument sound.

***Affirming the Consequent and Denying the Antecedent*** *Affirming the consequent and denying the antecedent* resemble two of the most common valid argument patterns—*modus ponens* (or *affirming the antecedent*) and *modus tollens* (or *denying the consequent*). We introduced both the valid and fallacious forms in chapter 2 and mentioned them again in chapter 4. We can display these patterns as follows. (Remember, in an if-then sentence, the "if" part is the antecedent and the "then" part is the consequent.)




***Valid***

*Modus Ponens* (Affirming the Antecedent)

*(1) If A, then B.*
*(2) A.*
*∴ B.*

***Example 6.12***

*(1) If my car is out of fuel, then it won't start.*
*(2) My car is out of fuel.*
(This premise affirms the antecedent.)
*∴ My car won't start.*

***Fallacious***

Affirming the Consequent

*(1) If A, then B.*
*(2) B.*
*∴ A.*

***Example 6.13***

*(1) If my car is out of fuel, then it won't start.*
*(2) My car won't start.*
(This premise affirms the consequent.)
*∴ My car is out of fuel.*

***Valid***

*Modus Tollens* (Denying the Consequent)

*(1) If A, then B.*
*(2) Not B.*
*∴ Not A.*

***Example 6.14***

*(1) If you respected her opinion, then you would seek her advice.*
*(2) You won't seek her advice.* (This premise denies the consequent.)
*∴ You don't respect her opinion.*

***Fallacious***

Denying the Antecedent

*(1) If A, then B.*
*(2) Not A.*
*∴ Not B.*

***Example 6.15***

*(1) If you respected her opinion, then you would seek her advice.*
*(2) You don't respect her opinion.* (This premise denies the antecedent.)
*∴ You won't seek her advice.*

The fallacious arguments at the right—affirming the consequent and denying the antecedent—are bad arguments because their patterns are invalid. Even if the premises are true, the conclusions could be false. My car could fail to start but not be out of fuel (for example, if the battery was dead). It could be true that I don't respect her opinion, but I could seek her advice anyway (for instance, to flatter her).

Here are some additional examples:

***Affirming the Consequent***

***Example 6.16*** *If the president does a good job, the economy remains stable. The economy has remained stable. So the president has done a good job.*

***Example 6.17*** ***Denying the Antecedent***

*If he denies that he knows her, then he's been cheating on me. He admitted that he knows her. So he hasn't been cheating on me.*

These are fallacies. The president could have done a poor job, even though the economy remained stable. Maybe the economy remained stable in *spite of* mistakes the president made. And the man in Example 6.17 could be cheating on his woman friend even though he didn't get caught. But the reasoning is good enough that it will often get by. Why is this? We have suggested that these fallacies resemble valid arguments. But which valid arguments? Surely we don't transpose the second premise and the conclusion of Example 6.16, changing it into the following *modus ponens* argument:

***Example 6.18*** *If the president does a good job, the economy remains stable. The president has done a good job. So the economy has remained stable.*

We are more likely to confuse the first premise of Example 6.16, *If the president does a good job, the economy remains stable* with *If the economy remains stable, the president has done a good job*. This would make Example 6.16 a valid argument. Perhaps we tend to confuse *If A, then B* with *If B, then A* because if B follows from A, it is fairly common for A to follow from B also. (If there's smoke, there's fire; if there's fire, there's smoke. If someone flips the switch, the lights come on; if the lights are on, someone flipped the switch.)

Thus, we might be fooled by Example 6.17 because we might confuse *If he denies that he knows her, then he's been cheating on me* with *If he's been cheating on me, then he will deny that he knows her.* This confusion *does* seem likely. And this change in the first premise would make Example 6.17 a valid argument.

In general, then, the fallacies of affirming the consequent and denying the antecedent can be persuasive because we tend to confuse *If A, then B* with *If B, then A,* and once we make this change, these fallacious forms become valid. When you identify these fallacies in Exercise 6.2, see if this account is not plausible.

***Equivocation*** When a word or an expression shifts meaning from one premise to another, it commits the fallacy of *equivocation*. We introduce this fallacy briefly in this chapter and discuss it at greater length in chapter 7, along with other issues concerning the way arguments are affected by differences in meaning. The related fallacy of *misleading definition* will also be discussed in chapter 7.

Here is an example of equivocation:

***Example 6.19***

*You are perfectly willing to believe in miracles such as a person landing on the moon. If this is so, you shouldn't be so skeptical of the miracles described in the Bible.*

In the first occurrence, *miracle* means something that is amazing, that you wouldn't have thought could be done. But in the second occurrence, *miracle* means something that defies the laws of nature. The fact that the first kind of miracle occurred doesn't make it more likely that the second kind occurred.

Example 6.20 might commit the fallacy of equivocation if it shifts the meaning of the term *small*.

***Example 6.20***

*In these times of scarce resources, people who drive small cars are to be commended. McGruder drives a small car. So McGruder is to be commended.*

A sense of "small car" that would make the first premise true would be "light car with a small engine." Perhaps McGruder's car has a small wheelbase but is a gas-guzzler.

Here is a more subtle example:

***Example 6.21***

*The law says that insane people should not be punished. Anyone who murders must be insane. So murderers should be treated in mental wards, not punished.*

The sense of *insane* that makes the first premise true concerns a person knowing right from wrong. The sense of *insane* that might make the second premise true concerns a person being abnormally cruel (which still could allow that the person knows that cruelty is wrong).

An equivocation is a bad argument because it can't have both a valid pattern and true premises. If the meanings of its terms are kept the same, one of the premises is false (as we have just seen); if on the other hand the meaning is allowed to shift, the argument is invalid. We can see this more clearly in the insanity argument if we simplify it to make the pattern apparent:

***Example 6.21 Argument in Standard Form***

*(1) All murderers are insane people.*

*(2) All insane people shouldn't be punished.*

---

*∴ All murderers shouldn't be punished.*

If *insane* is made to keep the same meaning, one of its premises is false, but it has a valid pattern:

***Pattern If No Equivocation***

*(1) All $P_1$'s are $P_2$'s.*
*(2) All $P_2$'s are $P_3$'s.*
Valid

*∴ All $P_1$'s are $P_3$'s.*

If *insane* shifts its meaning from one premise to the next, then it no longer has the valid pattern above. With the meaning shifting, the argument could be stated like this:

***Example 6.21 with Equivocation***

*(1) All murderers are **abnormally cruel** people.*
*(2) All **legally insane** people shouldn't be punished.*

*∴ All murderers shouldn't be punished.*

This argument has the invalid pattern:

***Pattern with Equivocation***

*(1) All $P_1$'s are $P_2$'s.*
*(2) All $P_3$'s are $P_4$'s.*
Invalid

*∴ All $P_1$'s are $P_4$'s.*

Why can arguments like these be persuasive? Like the other counterfeit fallacies, they closely resemble good arguments. Typically, an argument that commits the fallacy of equivocation would be valid if it were not for the shift in meaning. (In Example 6.21, for example, it would follow that murderers should not be punished.) Furthermore, all the premises can be made true by the shift in meaning (and sometimes the shift in meaning is barely noticeable). So if you lose track of the fact that the meaning has shifted, an argument that commits this fallacy seems sound.

***Begging the Question*** We stated at the beginning of this chapter that all but one of the fallacies we discuss are either invalid or have a false premise. Begging the question is the fallacy that could both be valid and have true premises. Why, then, do we call it a fallacy? Consider this example:

***Example 6.22***

*Whatever is less dense than water will float, because such objects won't sink in water.*

The premise of this argument happens to be true. The conclusion follows from the premise in the trivial sense that it simply restates the premise in different words. The argument has the pattern:

***"Trivial" Pattern of Argument That Begs the Question***

*(1) A*

*∴ A*

Technically, this pattern satisfies the definition of validity. If the premise is true, the conclusion must be true. Still, it is a bad argument because the premise does not give a *reason* for believing the conclusion. This is why the name "begging the question" is appropriate. When someone asks, "Why should I be honest?" that person is asking you to present an argument. If instead of doing this you say "Because you shouldn't be dishonest," you are *missing* the question at issue *(begging* the question).

The fallacy is fairly obvious in an argument as short as the one in Example 6.22, but in a longer, more complicated argument, you might not see that the conclusion is just a restatement of one of the premises. Consider, for example, the following exchange:

***Example 6.23***

**Realtor:** *If you're choosing between the house our competitors have listed and this one, you ought to buy this one. You'd make more money on it.*

**Customer:** *Why would I make more money on it?*

**Realtor:** *Well, you said you planned to sell in five years. You have to consider real appreciation, not just how many dollars you pay and how much you sell for. That means figuring in the rate of inflation. I would estimate that at the rate houses like this appreciate, taking account of fees, taxes, and so on, in five years you'd come out with a greater net profit on this house than on the other one.*

All the realtor really has said is that you'd make more money on this one because you'd make more money on this one.

In any valid argument, fallacious or not, the conclusion is, in a sense, contained in the premises. Taken together, the premises guarantee the truth of the conclusion. But remember that the object of presenting an argument is to make the conclusion more reasonable to believe. To accomplish this, you must use premises that, individually, will be taken to be more certain than the conclusion. *If a premise is either a restatement of the conclusion or a statement that will be equally doubtful on grounds similar to those which make the conclusion doubtful, then the argument doesn't make any progress toward supporting the conclusion and is guilty of begging the question.*

The following example begs the question even though the conclusion does not simply restate a premise:

***Example 6.24***

*The Bible says God exists, and everything the Bible says is true since God wrote it. Therefore God exists.*

Anyone who doubted the conclusion—God exists—would have the same reason for doubting the premise that God wrote the Bible.

## Review

A fallacy is a kind of argument that tends to persuade, even though it is a bad argument. So far, we have explained two ways a fallacy can be persuasive: by *distraction* (taking your attention away from the weak point of the argument) and by *resemblance* to a good argument. We describe seven of the most common falacies that use these tricks. They are listed below. It is important to see that what makes them persuasive is different from what makes them unsuccessful arguments. The distraction fallacies are bad arguments because they each have a false premise. The first three resemblance fallacies are bad arguments because they have invalid patterns. The last one—begging the question—has a pattern that is technically valid (A, therefore A), but an argument of this kind fails to give a reason for believing its conclusion. As you read through the list, try to state a general definition of each fallacy. If you have difficulty, refer back to the appropriate section.

**Distraction Fallacies**

1. *False dilemma.* Either we legalize drugs or we keep building new prisons and filling them with drug offenders.
2. *Slippery slope.* Now it's register handguns. Next it will be all guns. Then they'll ban guns, and we'll be set up for a police state.
3. *Straw man.* Senator Toski claims we should spend less on defense. The senator must think the instability in Eastern Europe poses no threat to our interests.

**Resemblance Fallacies**

1. *Affirming the consequent.* If the economy is healthy, unemployment is down. Unemployment is down. So the economy is healthy.
2. *Denying the antecedent.* If she loves you, she'll marry you. She doesn't love you. So she won't marry you.
3. *Equivocation.* Insane people shouldn't be punished. Someone who commits murder must be insane. So murderers should not be punished.
4. *Begging the question.* The Bible says God exists. Everything in the Bible is true, since God wrote it. So God does exist.

## Exercise 6.2 Identifying Distraction and Resemblance Fallacies

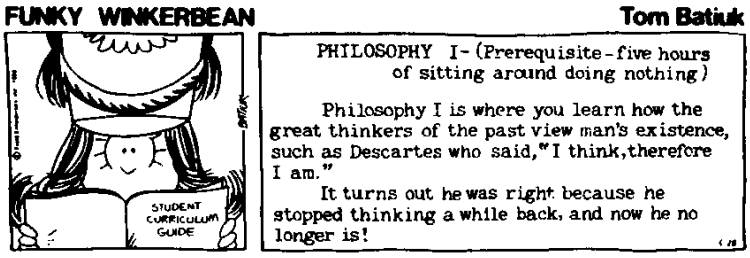
1. The following are all fallacies from the *resemblance* category (which includes affirming the consequent, denying the antecedent, equivocation, and begging the question). Identify the fallacy in each selection and discuss briefly why it might be persuasive.

   a. If everybody benefited from the present education system, then there would be no reason to change it drastically. But not everybody is helped by current teaching methods. So we should radically overhaul the way kids are educated.
   b. Callous though it sounds, I do not believe we have an obligation to redistribute wealth to the less fortunate. The reason that I believe this is that what a person earns is rightfully hers. No one else has a claim to it.
   c. They say that nice guys finish last. So let's finish last to show that we're nice guys. **(Hint: Write the first premise as an if-then statement.)**
   d. It won't be dangerous to ride with Gary, because he hasn't been drinking. If he had been drinking, it would be dangerous.
   e. The senator's denial of wrongdoing is hardly credible, since it is obvious that the senator was not telling the truth.
   f. If Alvin really loved Alice, then he would have given up his evil ways. He does seem to have reformed—he's even quit hanging out in pool halls and doing drugs. He must really love Alice.
   g. Ending affirmative action in college admissions is a bad idea. If this strategy had good results in California and Texas, then it would be wise to try it in other states. But it didn't have good results in California and Texas.
   h. To the editor: Five million illegal aliens in this country is more than a crime. It's an invasion. Why not just put the militaty in place to use lethal force to stop this invasion? (from the *Omaha World-Herald,* 1999)

2. *Creating examples of fallacies.* Write one example (of your own creation) of each of the following fallacies: affirming the consequent, denying the antecedent, equivocation, begging the question.

3. *Identifying fallacies—comprehensive review.* The following is a collection of fallacies from both the *distraction* and the *resemblance* categories. The fallacies may include instances of false dilemma, slippery slope, straw man, affirming the consequent, denying the antecedent, equivocation, and begging the question. Identify the fallacy in each selection and discuss briefly why it might be persuasive.

a.


FUNKY WINKERBEAN
Tom Batiuk
PHILOSOPHY I- (Prerequisite-five hours of sitting around doing nothing)
Philosophy I is where you learn how the great thinkers of the past view man's existence, such as Descartes who said, "I think, therefore I am."
It turns out he was right because he stopped thinking a while back, and now he no longer is!
STUDENT CURRICULUM GUIDE

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b. If you can't lick them, join them.

c. According to my theory, men who had doting mothers will seek women who are independent and not overly affectionate. This is a reaction to having been smothered by their mothers' affection. Now if my theory is correct, Ed would be attracted to someone like Carla. Ed *is* attracted to Carla. So I would say that my theory is correct.

d. If a society encourages freedom of thought and expression, then creativity will flourish. New theories will replace old ones; traditions will be challenged; inventiveness will reign. The eighteenth century was perhaps the period of American history when creativity flourished most, showing the degree to which free thought was encouraged during that period.

e. Should you be hip or smart?[3]

f. Most students go to college to improve their job prospects. But the fact is that many areas of study—particularly the liberal arts—don't strike students as preparing them for a vocation. They fail to see that living a life enriched by ideas *is* a kind of vocation. So when they quit college to get a job they are making a big mistake.

g. If I continue to live in the dorm, the noise will make me nervous and irritable. I'll worry all the time about not getting my studying done. I'm honestly afraid that I'd have to start seeing a psychiatrist about these problems. I'd have to borrow the money for the psychiatrist from my parents. And if I flunk out of school I wouldn't be able to get a good job to pay them back. The alternative is to move into a nice apartment complex near campus. It's pretty expensive, but actually it might save money in the long run.

h. So the thing to do when working on a motorcycle, as in any other task, is to cultivate the peace of mind that does not separate one's self from one's surroundings. When that is done successfully, then everything else follows naturally. Peace of mind produces right values, right values produce right thoughts. Right thoughts produce right actions and right

3. *Esquire Magazine*, September 1994.

actions produce work that will be a material reflection for others to see of the serenity at the center of it all.[4] **(Hint: This might be interpreted as committing one of the fallacies "in reverse.")**

*Note: What seems to be a fallacy may not be one. Some additional arguments that may or may not commit fallacies are presented at the end of the chapter.*

## Emotion and Reason in Argument

In the first part of this chapter, we discussed fallacies that can be persuasive because of the sleight-of-hand tricks they play. In this part, we discuss a source of persuasiveness that is quite different: confusing emotion with reason. We identify three prominent fallacies that draw their persuasiveness from this source. Then, to complete our discussion of fallacies, we identify two fallacies that rely on a combination of sleight of hand and emotion in order to persuade and that can be extremely effective as a result.

Before examining the illegitimate use of emotion in argument, note that there are many cases in which it is appropriate for an argument to appeal to emotion. We may become clearer about what is involved in fallacious appeals to emotion if we contrast these cases to legitimate ones.

Suppose a friend tries to convince you to wear a helmet when you ride your motorcycle. The friend describes some severe head injuries received by other riders who didn't wear helmets. You are reminded of how miserable your friends and parents would be if you suffered such an injury. And the friend points out that if you wear a helmet you are much less likely to be seriously injured. Your friend has certainly appealed to emotion, but was that appeal illegitimate? It would hardly seem so. When you are considering an action that will affect you or other people for good or for ill, one kind of consideration that is relevant is just *how* well or *how* badly you or others will be affected. If certain consequences of your actions have only limited probability of occurring, or will occur far into the future, or will be removed from your sight, then you tend to ignore them. You need to be reminded graphically of them—have them brought before your consciousness as though they were immediate.

Consider a different example. Suppose that you are deciding whether to give political support to a government policy that may make ethnic war in some part of the world more probable. If a friend reminds you of the horrors of modern warfare and all its innocent victims, this appeals to emotions but is certainly legitimate.

4. Robert M. Pirsig, *Zen and the Art of Motorcycle Maintenance: An Inquiry into Values* (New York: Bantam Books, 1974), 290.

The *amount of weight* that should be given to such an appeal, however, is open to question. The possible bad consequences could be pictured so graphically that you would lose sight of any potential benefits of the policy in question—benefits that should be weighed against possible risks. Suppose the policy involves making a strong response to the aggression of a group preaching "ethnic cleansing." Perhaps the reaction in question is not so strong as to *significantly* raise the probability that the conflict will spread. Perhaps a weaker reaction would have some chance of leading to war also, because it would encourage future aggression. All these considerations must be weighed; they must not be neglected. An appeal that arouses emotion, even if it is relevant to the issue, runs the risk of leaving a one-sided impression because of the way such an appeal can command your attention. The point remains, nevertheless, that an emotional appeal can be a legitimate kind of appeal, as we have seen from our two examples.

## When Is an Emotional Appeal Illegitimate?

Let's contrast the cases we have just described to one in which the appeal to emotion is not legitimate. Suppose you are deciding which of two candidates is better qualified for office. You discuss the choice with your parents and they get upset about the candidate you are favoring. They support the other candidate and claim that you are being disloyal. You decide their candidate isn't so bad after all.

If the question to be decided is which candidate is better qualified, then the appeal to loyalty is an illegitimate appeal to emotion.[5] There is a difference between this example and the earlier examples in this chapter. In the earlier examples, the question was whether a certain act should be done: Should you wear a helmet? Should you support a certain foreign policy? These actions might have certain consequences—injury, death—and considering these consequences arouses emotions. But these consequences *must* be considered to determine whether the actions in question should be taken. In the candidate example, however, the question of whether your choice will upset your parents is *not* relevant to whether your candidate is better qualified. The fact that your parents want you to be loyal might give you a *motive* for believing that their candidate is better. But this consideration does not provide support, in the sense of evidence, for the belief that their candidate is better qualified. Does the candidate in question have

5. We are not, at this point, identifying the particular fallacy being committed here. We are still in the process of characterizing a general category of fallacies. Depending on how your parents stated their argument, they could be committing any one or more of the fallacies to be discussed later: *appeal to force, appeal to pity,* or *prejudicial language*.

good judgment? Would the candidate's programs succeed? Is the person honest? These are the relevant kinds of considerations that would determine the candidate's qualifications.

We must be careful here to make a certain distinction. If you are considering whether to state your political preference in front of your parents, or even whether to act on the basis of your preference when you go to vote, then the question of loyalty *might* be considered relevant. This question of how to act is a question of ethics. Should you let family loyalty override your own political principles? You may feel that one of these factors clearly outweighs the other. For example, you may feel that it is much more important to maintain your own integrity by voting according to your conscience than to remain loyal to your family. But although this factor of loyalty might be outweighed when it comes to voting, it is totally irrelevant when it comes to deciding which candidate is better qualified. When you are deciding how to act, all motives are in a sense relevant. But when you are deciding what to believe, these motives are not relevant. The fact that it would be more comfortable for you to believe that your parents' candidate is better qualified gives you a *motive* for holding that belief, but it does *not* provide evidence that the belief is true.

We will call fallacies that provide a motive for belief rather than supporting reasons *emotion* fallacies. Three fallacies within this category deserve discussion. Two of them are commonly recognized and have acquired names: *appeal to force* and *appeal to pity*. The other, although commonly used, is not as commonly identified and is referred to by different names at different times. We call it *prejudicial language*.

## Emotion Fallacies

1. Appeal to force
2. Appeal to pity
3. Prejudicial language

***Appeal to Force and Appeal to Pity*** *Appeal to force* and *appeal to pity* can best be explained together because they have an important similarity. *When people get you to agree to something because they will be hurt if you in some way don't agree, this is an appeal to pity. If people get you to agree because they will hurt you if you don't agree, this is an appeal to force.*[6] In both cases, the factor that makes the argument persuasive is motive in place of support. That is, both appeal to force and appeal to pity make it undesirable not to believe that the conclusion is true even though

6. Notice that although this fallacy is called *appeal to force*, the harm threatened need not be physical harm.

they do not give support (in the sense of evidence) for believing that the conclusion is true. This seems fairly clear in the following examples.

***Appeal to Force***

***Example 6.25*** *So you're an environmentalist. I'd think twice about that if I were you. There are* a *lot of people in this town who depend on the lumber industry. They aren't going to be very happy with you if they find out about your views on preserving forests.*

***Example 6.26*** **Diplomat A:** *We think the interference of your country in our internal affairs is unjustified.*
**Diplomat B:** *That is a very unwise opinion to hold when we are considering a trade embargo against you.*

***Appeal to Pity***

***Example 6.27*** *I am qualified for the job. I have a little experience in the area, and I've been out of work for two months so I really need the money.*

***Example 6.28*** *Your mother and I devoted years of our lives raising you to believe in the Christian religion. Don't you know how it hurts us for you to abandon those beliefs now?*

In each of these examples, it is not that a certain belief is made desirable, but rather that it would be harmful (either to yourself or others) to *not* hold a certain belief—that environmentalism is a bad policy, that a political action was justified, and so on. It might seem unlikely that you would be fooled into *believing* these things; rather, you might just *say* you believed them to avoid certain undesirable consequences. If this were the case, you really couldn't be accused of committing a fallacy; you might be doing a very reasonable thing. The problem is, we often end up convincing ourselves that we really do believe the position we publicly state. Perhaps we convince ourselves because we don't like to admit that we didn't stand up for the truth. Let's look at two other examples in a little more detail.

***Appeal to Pity***

***Example 6.29*** *A friend asks you to write a letter of recommendation for him, but he is not really qualified for the job. You write the letter saying he is qualified, because you know it will hurt his feelings if you don't.* ***(And you end up convincing yourself that he really was qualified.)***

***Appeal to Force***

***Example 6.30*** *You are asked to evaluate the performance of your supervisor at work. She has done a very poor job, but you give her a high evaluation because she has made it clear that she can make it tough on you if you don't.* ***(You end up saying to yourself, "I didn't really lie. The supervisor did a pretty good job.")***

Two issues must be kept separate in situations like these. One is whether you should state something to avoid harm to others or to yourself, even though the statement is probably not true. This is a moral question, not a question of logic. In some circumstances, you might believe that a greater moral end outweighs the obligation to be truthful. The second issue is whether you should believe such a statement if you do make it. This *is* a matter of logic, and the answer is no. To do so would be to commit a fallacy. It is important to see that these two issues are often confused. The desirability of a conclusion and the evidence for it (the motive and the support) seem to operate as competing forces; either one can be strong enough to produce belief, even though they are totally different. If you think about the plausibility of Examples 6.29 and 6.30, about the discomfort people feel in acknowledging that they have lied, and about the uncanny ability of people to tailor their beliefs to make themselves comfortable, then you will probably agree that appeals to force and to pity *can* be persuasive.

Why are appeal to pity and appeal to force bad arguments? Do they all contain false premises, or do their conclusions not follow from their premises? Looking at some simplified models of this kind of argument will help us understand what is going wrong.

***Appeal to Force—Model 1***

*(1) If you appear to believe X, you will be harmed.*

*(2) You don't want to be harmed.*

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*∴ You should not believe X.*

In this interpretation, the conclusion doesn't follow. Even if you accepted the premises, it doesn't follow that you shouldn't believe X, just that you shouldn't let the arguer know that you believe X. You could still decide what to believe on the basis of what you think is true.

***Appeal to Force—Model 2***

*(1) If you believe X, you will be harmed.*

*(2) You don't want to be harmed.*

---

*∴ You should not believe X.*

In this interpretation, the first premise will be questionable for the same reason that model 1 is invalid. You could believe X but avoid being harmed by not letting on that you believe X.

Perhaps neither of these first two models raises the moral issue that makes appeal to force troubling. Let's represent the argument as it might occur to the person receiving the threat of force.

***Model That Raises the "Moral Issues"***

*(1) Either I appear to believe X or I will be harmed.*

*(2) I don't want to be harmed.*

*(3) I don't want to appear to believe X and not really believe it. (That is, I don't want to pretend to believe what I don't.)*

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*∴ I should appear to believe X and really believe it.*

This person is in a difficult position. The person could give up premise 2 and face the harm, go ahead and pretend (giving up the moral principle in premise 3), or somehow accept something dubious. What doesn't follow from the premises of this argument is that X is true, so for the person to believe that X is true on the basis of this argument (that is, to take the third option) would be to commit a fallacy.

Until now, we have spoken loosely of a fallacy being committed, without specifying whether it is the person offering the fallacious argument or the person accepting it. In this last instance, it seems reasonable to say that *both* parties are committing a fallacy. However, as stated before, if someone makes a statement to avoid personal harm or harm to others but does not believe it, then the person is not committing a fallacy of appeal to force or pity but using deceit as a tactic in a difficult situation.

***Prejudicial Language*** An argument can also provide a motive for belief without providing support for belief by using *prejudicial language*. Consider these examples:

***Example 6.31*** *I hope you aren't going to say that you support the backward philosophy of emphasizing basic skills in primary and secondary education. I tend to take the progressive view that there are many things at least as important for students to learn as reading, writing, and arithmetic.*

***Example 6.32*** *Chris outgrew the naive view of human beings as mechanistic, robotlike creatures and came to the more sophisticated view of human beings as autonomous and possessing a will.*

Identifying a position using such words as *backward* or *naive* provides a motive for rejecting the position, and using such words as *progressive* and *sophisticated* provides a motive for adopting a position, all without giving any evidence either for the arguer's own or against an opponent's position. There is an element of trickery or distraction here, since in each example two issues are falsely presented as one: (1) Do you support teaching basic skills? (2) Is such a philosophy backward? and (1) Did Chris give up a mechanistic view of humankind? (2) Is such a view naive? But the main persuasive factor is motive in place of support. You would often not separate the two issues and argue each one through,

because the prejudicial language causes you to either endorse or reject the position in question before any discussion can get started.

Should we say that to use prejudicial language is to advance a poor argument? In an example like "I hope you're not going to say that you support the backward philosophy of emphasizing basic skills in primary and secondary education," reasons are not *explicitly* given for a conclusion. Yet it is implied that emphasizing basic skills is a backward philosophy, and if it is a backward philosophy, then it is incorrect. When these claims are made explicit they are less compelling. In fact, if we decided that these implicit claims were correct, we wouldn't call the language "prejudicial." Similarly, we wouldn't call it prejudicial to say, "I hope you don't condone a careless attitude toward the dangerous disease, AIDS." It would be accurate, then, to say that using prejudicial language is to implicitly convey an argument with false premises. We would also say that the person on the receiving end is responsible for scrutinizing the premises implied through the use of prejudicial language.

## Exercise 6.3 Identifying Fallacies: Appeal to Force, Appeal to Pity, and Prejudicial Language

Identify instances of the fallacies of appeal to force, appeal to pity, and prejudicial language that occur in the following passages. Note that prejudicial language can be used in combination with other fallacies.

1. How can you call my serve "out" when it's that close and I'm behind five games to one?
2. Politicians should keep in mind, when they are deciding whether abortion is right or wrong, that we pro-lifers have big families who grow up to be part of the voting public. Pro-abortionists tend to have no families at all.
3. You've been contradicting everything I say. The point I'm making is an obvious one. Nationalized health care will ruin the quality of medical practice.
4. Senator Adamson has been critical of every policy this administration has proposed. Perhaps we should make the senator's ideological errors clear by emphasizing that we can arrange income tax audits for government officials.
5. I've poured my soul into the task of writing this novel. I've worked on it late at night after spending the day on my regular job. I've endured rejections, gone through revisions, and at last it's published. What do you think about it?
6. You say we need to expand Head Start programs? There you go again, thinking we can solve problems by throwing money at them.

7. Do I need to remind you how difficult it might be if you decide that you won't go out with me? After all, I make personnel decisions around here.
8. More tax "incentives" for the ultra-rich? When are you going to grow out of that outdated, Reaganite, "trickle-down" mentality?

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## Emotion and Resemblance Combined

1. Appeal to authority
2. Attacking the person

These two fallacies—and particularly *attacking the person*—are probably the most common and most persuasive fallacies. They draw from *two* sources of persuasiveness: These fallacies appeal to emotion by using your disapproval of a person to turn you against a point of view or by using your admiration for a person to turn you in favor. At the same time, these two fallacies resemble good arguments. There are many legitimate cases of appealing to expertise of authorities or of attacking the credibility of someone making a claim. The fallacious cases of appeal to authority or attacking the person borrow some persuasiveness from these legitimate cases.

***Appeal to Authority and Attacking the Person*** We often doubt a statement because there is something wrong with the person who makes it, or give additional credit to a statement because a famous or highly admirable person makes it. Sometimes it is legitimate to do this, but more often, these moves constitute a fallacy.

***Appeal to Authority***

***Example 6.33*** *A majority of doctors think that the morals of our young people have declined.*

***Example 6.34*** *Meryl Streep doesn't approve of using pesticides on crops. It's probably a bad idea.*

***Attacking the Person***

***Example 6.35*** *Our former mayor favored legalizing prostitution. But he was the most corrupt mayor we ever had. There's no way we should legalize it.*

***Example 6.36*** *Most of the men who say war is wrong are cowards.*

Although doctors may be much admired and knowledgeable in the field of medicine, there is no reason to believe they are experts in the field of morality. A similar criticism can be made of the argument concerning the use of pesticides on crops. The question of whether prostitution should be legalized is independent of the question of the character of its supporters; and the question of

whether war is wrong is independent of the question of the courage of its opponents.

As we will see, it is sometimes legitimate to appeal to an authority. The fact that an expert makes a claim about something that truly lies within this person's area of expertise is a reason in favor of believing it. Also, pointing out correctly that someone is prone to lie can be a good reason against believing what this person says. Appealing to authority is a fallacy when a person really isn't an authority in the area in question. Attacking the person is a fallacy when the person gives reasons for his or her point of view—reasons that can be judged independently of the person's character or motives. In such cases, what makes an appeal to authority or an attack on the person a bad argument is that the premises are *irrelevant* to the conclusion. Even if I am a physician, and I say that morals have declined, it doesn't follow that morals really have declined. Even if I am a coward, that is irrelevant to whether I am correct about war being wrong.[7]

But since these criticisms seem fairly easy to make, the same question should be asked of these fallacies as was asked of the previous fallacies: Why do they tend to persuade? The answer is they rely on both motive in place of support and sleight of hand, but in subtle ways.

***How Both These Fallacies Appeal to Emotion*** If you like a person, this is a motive for agreeing with the person. You treat agreeing with someone as a way of honoring that individual. Similarly, if you don't like a person, this is a motive for disagreeing with the person. For example, liking an actress such as Meryl Streep might make you inclined to agree with her position on the use of pesticides. And the idea that someone is a coward might make you less inclined to honor him by agreeing with his view on war.

But there is a further dimension to be explored here. Recall our discussion in chapter 1 of the double arena in which argument takes place. An exchange of views is unfortunately often seen as a sort of contest, as well as an occasion to determine what is reasonable to believe. It is in part a victory to discredit the other person's point of view and a defeat to be discredited. In this arena, discrediting your opponent is on a continuum with insulting and physically attacking. A *person* is being engaged in a contest, not just a point of view. Looked at in this way, the fallacy of *attacking the person* gains effectiveness because it identifies a person as a common enemy—someone it would be satisfying to defeat—and it associates a certain point of view with this enemy. This approach helps create a motive for the person hearing the argument to attack the enemy's point of view as a way of doing battle with another individual. And by contrast, associating a point of view with someone who is generally admired makes one less inclined to attack the view because to do so would be to take this person on as an opponent.

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7. The arguments in question could be made valid by adding implicit premises, but such premises would be wildly implausible.

***How a Fallacious Appeal to Authority Resembles a Good Argument*** It is often legitimate to defend a statement by appeal to authority. Because of this, even when an appeal to authority is fallacious, it draws some persuasiveness from its similarity to the legitimate cases.

It is certainly not a fallacy to say you should take a particular medicine because a doctor prescribed it. Since we don't have time to become experts in every field, it often makes sense to trust someone (within limits) who has proof of expertise in a certain field. Unfortunately, a "halo" effect seems to apply to statements that lie outside an expert's area of knowledge.

This is particularly the case if some relationship is believed to exist between the area in which the person *is* an expert, and the area in which he or she is offering an opinion. As a result, we have examples such as:

***Example 6.37*** *Astronaut Willard has been to outer space and believes there is a God.*

***Example 6.38*** *Judge Wong believes that most murderers are really mentally ill.*

Sponsors are probably shrewd to have actors who play doctors on television endorse pain relievers and other medicines. After all, thousands of people wrote to Marcus Welby, M.D., for medical advice.[8]

In between the cases in which appeal to authority is clearly legitimate and cases in which it is clearly fallacious, there are a disturbingly large number of cases that are difficult to decide. If someone has the title "physicist" and supports nuclear power, how much more weight should his opinion carry than the opinion of an ordinary citizen who has done some reading on the subject? If someone teaches economics, what additional weight should be given to her views on how to combat inflation? We examine this troublesome issue in chapter 11.

***How a Fallacious Attack on a Person Resembles a Good Argument*** It is also legitimate in some cases to criticize a statement by attacking the person who makes it. This similarity to legitimate arguments lends persuasiveness to *attacking the person,* even when such an attack is fallacious. To see why attacking the person is sometimes legitimate, let's consider the example of a witness in a court of law. Suppose that Thompson says he saw Smith take a woman's purse. If we have no reason to believe that Thompson wants to deceive us, then we will take his statement as evidence (at least partial evidence) that Smith did take the purse. But if we hear testimony that Thompson hates Smith or has often lied before, then these attacks on the person will justifiably discredit his testimony by showing an ulterior motive.

It is legitimate to attack Thompson's statement by attacking his credibility because our initial faith in his statement was based on the fact that Thompson had

8. Jerry Mander, *In the Absence of the Sacred* (San Francisco: Sierra Books, 1991), 88.

been in a position to see what went on, had presented his statement, and had had no apparent reason to lie. But in other cases it is *not* legitimate to attack the person making a claim. Suppose someone is offering an argument—premises in support of a conclusion. In such cases it is legitimate to attack either her premises or the validity of her argument, but attacking the person making the argument is irrelevant.[9] Still, because attacking the person is relevant in the courtroom testimony kind of case, it can *seem* relevant in this latter case also.

Perhaps we can clarify the distinction between a legitimate attack on a person and an illegitimate one by applying it to more examples. Contrast the attack made by the supervisor against the manager with that made by the father against the daughter in these examples:

***Example 6.39***

**Manager:** *Charles shouldn't get the promotion. I worked with him two years ago and he never did his share.*

**Supervisor:** *I doubt that you can judge him impartially. You've been hostile toward him ever since that woman chose to marry him instead of you.*

***Example 6.40***

**Daughter:** *I don't believe that God exists. If there were such a being, then it would not allow all the suffering we see in the world.*

**Father:** *You've just turned against religion because you think it isn't fashionable. None of those so-called intellectuals you hang out with believe in it.*

In Example 6.39, the supervisor's attack on the manager is relevant. The manager expects his testimony about Charles's work record to be taken as evidence by itself that Charles doesn't deserve the promotion. But the credibility of this testimony is damaged by the information about the manager's attitude toward Charles. Example 6.40 is different in that the daughter is not simply expecting her father to believe her testimony against God's existence. She is giving a reason, the strength of which can be judged independently of an assessment of the daughter's character or circumstances. Her father's attack on her is irrelevant.

It is not always easy to judge how much weight to give to an attack on a person's credibility. Even with the example of the manager, although it is *relevant* to point out his hostility toward Charles, does it follow that his testimony should be discounted completely? A judgment must be made of how biased the manager is and how able and inclined he is to overcome bias in making claims about other people. These judgments, although they lack precision, are not impossible to make. Often, corroboration from other sources helps determine a person's credibility.

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9. If she is simply expecting you to take her word that her premises are true, an attack on the person might still be relevent. But if she is drawing from information that is generally accessible to anyone, an attack on the person is not legitimate.

In analyzing legitimate and fallacious cases of attacking the person, we have sought to do two things. First, we have tried to show that there are legitimate cases; this fact accounts, in part, for why fallacious cases tend to be convincing. (This is in addition to the more obvious appeal to emotion in place of reason.) Second, we have sought to show how you can distinguish, if you are careful, between the legitimate and fallacious cases of attacking the person.

***Variations of the Fallacy of Attacking the Person*** Certain common variations of this fallacy have been given separate names. Think about the differences among the following examples:

***Example 6.41*** *Discipline is important in education. Rousseau opposed discipline, but he was a pervert.*

***Example 6.42*** *Senator Spohn says we've been too hasty in closing our military bases. But she's got a base in her home state that she's trying to save.*

***Example 6.43*** *You're telling me I should drink less? You haven't been sober in a year.*

Whereas Example 6.41 is a straightforward attack on a person's character (calling Rousseau a pervert), Example 6.42 attacks a person's credibility by suggesting that she has something to gain by getting people to agree with her. These two variations are occasionally referred to by their Latin names, *ad hominem abusive* and *ad hominem circumstantial,* respectively. *(Attacking the person,* in general, is often referred to by the Latin name *ad hominem.)* Example 6.43 points out that a person has the same fault that the person is accusing someone else of having. This is called *tu quoque* (Latin for "you, too"). Of the three variations, *ad hominem abusive* relies most heavily on emotion for its persuasiveness. *Ad hominem circumstantial* draws its persuasiveness primarily from its similarity to legitimate attacks on credibility. *Tu quoque* moves a discussion from the arena of critical reasoning to that of a personal contest of dominance and humiliation.

## Review

It might be helpful to review the twelve fallacies identified and discussed in these chapters. They are arranged in categories below, with an example of each.

**Distraction**

1. *False dilemma.* The arguer claims there are only two alternatives and one is unacceptable, so we should choose the other. But in reality, there are more alternatives than the two stated.
   *Example:* Either we legalize drugs or we keep filling prisons with drug offenders.

2. *Slippery slope.* The arguer says we shouldn't do P because P probably leads to Q, which probably leads to R, and so forth down the "slippery slope" to a final consequence that is clearly undesirable. But some of these steps are implausible.
   *Example:* Now they want us to register handguns. Next it will be all guns. Then they'll ban guns, and we'll be set up for a police state.

3. *Straw man.* The arguer makes a position appear strong solely by making the opposing position appear weaker than it really is. The arguer puts a weak argument in an opponent's mouth when stronger arguments are available.
   *Example:* People who believe we should spend less for defense apparently believe that the instability in the former Soviet Union and Africa poses no threat to our interests.

**Resemblance**

1. *Affirming the consequent.* Any argument that has the following invalid pattern:
   *(1) If A, then B.*
   *(2) B.*
   *∴ A.*
   *Example:* If the economy is healthy, unemployment is down. Unemployment is down. So the economy is healthy.

2. *Denying the antecedent.* Any argument that has the following invalid pattern:
   *(1) If A, then B.*
   *(2) Not A.*
   *∴ Not B.*
   *Example:* If she loves you, she'll marry you. She doesn't love you. So she won't marry you.

3. *Equivocation.* An argument in which an expression shifts its meaning from one premise to another, making the pattern invalid.
   *Example:* Insane people shouldn't be punished. Someone who commits a murder must be insane. So murderers should not be punished.

4. *Begging the question.* An argument resting on a premise that is either a restatement of the conclusion or that would be doubted for the same reasons that the conclusion would be doubted.
   *Example:* The Bible says God exists. Everything in the Bible is true, since God wrote it. So God does exist.

**Emotion**

1. *Appeal to force.* The arguer tries to get you to agree by indicating that *you* will be harmed if you don't agree.
   *Example:* If you want to keep working here, you should reconsider your criticisms of company policy.
2. *Appeal to pity.* The arguer tries to get you to agree by indicating that *she* will be harmed if you don't agree.
   *Example:* I *am* qualified—I have some experience and I really need the money.
3. *Prejudicial language.* The arguer uses language that biases you in favor of a position or against an opponent's position without giving evidence for or against the position.
   *Example:* Would you be so naive as to doubt the generally accepted fact that the finest painters were French?

**Emotion and Resemblance**

1. *Appeal to authority.* Appealing to someone whose expertise is not relevant to the issue at hand. Or appealing to someone who is famous or admired, but not an expert on the issue at hand.
   (*Note:* We have just described *fallacious* appeals to authority. There are also *legitimate* appeals to authority—appeals to people who really are experts in the appropriate areas.)
   *Example of fallacious appeal:* A majority of doctors think that the morality of young people has declined.

2. *Attacking the person.* Arguing that a person's point of view should be doubted because the person has bad traits of character or because the person has something to gain by being believed.
   (*Note:* There are legitimate as well as fallacious cases of attacking the person. See text above.)
   *Example of fallacious attack:* Most of the people who want drugs legalized are closet users.

## Note on Terminology

Some of the terms we have used in this chapter are terms that are commonly used, while others are terms we invented. The idea of categorizing fallacies by their source of persuasiveness—*distraction, resemblance, emotion,* and *emotion and resemblance combined* is our own. A more common (but in our view less useful) division is into formal and informal fallacies, with such fallacies as affirming the consequent and denying the antecedent included under "formal," and most of the remaining ones included under "informal." All the names for individual fallacies are fairly commonly used, except for *prejudicial language*. Fallacies in which language creates prejudice *against* a certain view are commonly called *poisoning the well*. We used a broader category name so that we could include cases of prejudice *in favor of* a view.

People often use Latin names for fallacies. We noted these for the variations of *attacking the person (ad hominem abusive, circumstantial,* and *tu quoque).* Some other commonly used Latin names are *petitio principii* ("petitioning the premises") for *begging the question, ad baculum* ("to the stick") for *appeal to force,* and *ad misericordiam* ("to misery") for *appeal to pity.* Another commonly used Latin term is *non sequitur.* Calling an argument a *non sequitur* means literally that the conclusion *does not follow*—that is, the argument is invalid. More specifically, this term is often used to apply to an argument whose conclusion is wildly different from anything suggested by the premises.

## Exercise 6.4 A Comprehensive Review of Fallacies

1. Write an example (of your own creation) of each of the following fallacies introduced in this chapter: appeal to force, appeal to pity, prejudicial language, attacking the person, appeal to authority.

2. The following passages contain fallacies from all the categories we have discussed. For each passage, identify the fallacy or fallacies.

   a. Is gun control legislation justified? Yes. The argument by those who oppose it seems to be that it is a great inconvenience to register guns. But this inconvenience is incidental when you consider the stakes. Either we pass an even stronger gun control bill or we can watch the violence in our cities continue. Gun control cannot be seen as unconstitutional in these modern times, for the reason that the so-called right to bear arms is completely out of date.

   b. So you're thinking of buying a fancy car. I never thought you'd cave in to the crass materialism that has infected our culture.

   c. Anyone who serves as president of this organization has a duty to promote its interests—that's written in the charter. Supporting equality of the sexes goes against the interests of this organization. A duty is, by definition, a moral obligation. So as president of this organization, I have a moral obligation to oppose equality of the sexes. Actually, this is an obligation I am happy to fulfill, because I firmly believe that sexual equality is a dangerous idea. You can predict the kind of behavior it will produce in women generally if you look at the angry, hysterical, man-hating females who are leaders of this movement. I would argue that the gentle, ladylike demeanor that is befitting of womankind will all but disappear if the feminists succeed in promoting their cause.

   d. As warden, I don't think your complaints about how this penitentiary is run are well founded. The parole board is not likely to look favorably on the attitude you have been taking. You seem to think that inmates are entitled to dictate the policies of this institution. To me, this is not consistent with the purposes for which you are here. If inmates are made to feel that they have done wrong, they have a chance of becoming reformed. With your proposals, they would not be made to feel they had done wrong. So they wouldn't have a chance of being reformed.

   e. Rudi says that the government should provide more jobs for people. He should know. He couldn't get a job on his own if he had to. I had to look for months before I found work. My family even ran low on food. It was humiliating to plead with employers for a job. But I stuck it out and found work, and people like Rudi can do the same.

   f. Those animal rights weirdos have really gone around the bend. Now they're saying no one should wear a fur coat. They won't be happy until we're all eating bean sprouts and wearing sackcloth. To them, a weasel is a dog is a human. Everything's the same.

   g. The idea of promoting the general welfare is firmly planted in our Constitution. How, then, can you oppose welfare programs and claim to

uphold our Constitution? If we cut back on welfare programs, people will be put out of jobs, and the poor will not be getting services they need. Resentment toward the system will build up again, and we'll have the same kind of rioting we did in the 1960s.

h.

**Commissioners in Developers' Pockets**
**Editorial: *The Daily Herald***

The County Commissioners want to destroy the country. They are in the pockets of the big land developers. The rezoning decision of last week just proves it. Once multiunit dwellings are permitted in neighborhoods with single-family dwellings, then the sense of community that now exists will be lost. Before you know it we will have strip development as far as the eye can see. Fastfood places will be squeezed between discount stores. If we resist the developers now, then our community will be saved. The voters will remember how the commissioners voted during the next election.

Cynthia Drew
1212 N.W. Breadbasket
City

i. Two congressional committees have issued scathing reports which condemn about every aspect of the cancer insurance industry and the product it offers to the public. One committee recommended that the sale of cancer insurance to the elderly be banned by federal law. . . . Statements in the report of the committees, as quoted in news stories, are too ridiculous to be taken seriously, although a lot of congressmen apparently are not laughing. Neither should the public be laughing because the thrust of this blatant effort to destroy a private business is a new warning that bureaucratic wrath and bureaucratic thirst for power threatens our very freedom of choice and individual preference . . . and isn't it a bit frivolous to have congressional committees, which will BUY just about anything ($660 billion worth a year and climbing), advising the public on how to spend $25 to $75 a year?[10]

10. Millard Grimes, advertisement for American Family Life Assurance Company, originally published in the Columbus, Georgia, *Sunday Ledger-Enquirer.*

## Exercise 6.5 Fallacious or Not?

It is debatable whether any or all of the following passages commit fallacies. Write a brief discussion of each passage, explaining why you think a fallacy is or is not being committed. You may wish to refer back to the relevant sections of the text for help in your deliberations.

1. The decision of whether to convict this man is more than academic. We are talking about sending a flesh-and-blood human being like you and me into a cage. He is a man with a family—his family is surely innocent of any offense. And yet they will suffer too because of the absence of a breadwinner. These are some of the consequences you will bring about if you decide to convict.
2. I believe the economic issue is the important one in this election. I don't know that much about economics myself, but my mother-in-law teaches economics and my uncle has run a large business for years. I've talked it over with them, and I think that the Republican candidate would probably do a better job of guiding the country's economic policies.
3. You can't claim that you have a *right* to free child care, for the reason that neither I nor anyone else has an *obligation* to provide it. What have we done to create such an obligation? You might think that I am merely assuming what I am trying to prove. But by getting you to look at the matter from my point of view I hope you will be less inclined to claim that something you simply desire is your *right*.
4. The company was responsible for sending Bert into the chamber without properly checking for poisonous gases. Clearly, Bert has suffered substantial nerve damage that confines him to his home and makes it difficult for him to carry out even the most mundane activities such as feeding himself. The action of the company has caused him great physical pain and psychological suffering. He deserves compensation.
5. Here you are quoting Franklin on the subject of how one should live his life. But what kind of a life did Franklin himself live? I've read that he was a very difficult man, prone to depression, hard to please, impatient with those around him. When you judge a man's philosophy you have to see how it worked for him.
6. Tina has never had a teddy bear. A mother's love. A doll to cuddle. Tina knows nothing of these things. But she does know fear, rejection, and hunger. For just $15 a month, you can help save a child like Tina. Through our "adoption" program you can help provide a child with a better diet, clothes, med-

ical attention, school. And even a toy or two. But don't wait. There are so many. And somewhere, right now, a child is dying from starvation and neglect.[11]

7. If you look at a map you'll see that the outline of South America closely parallels that of Africa. This and other similarities between the coast of North America and Europe justify the theory that these continents were at one time part of one supercontinent and have subsequently moved apart. If the geological theory of plate tectonics is correct, then we would expect just such movement.

8. The Oklahoma City bombing shows the depth of discontent in the United States. Although we can't condone this kind of violence, we have to face up to the conditions that created it. People have become convinced that government, particularly the federal government, is not acting in the people's best interests. Either we make radical changes in the way Washington relates to the people, or we face the possibility that activity by the federal government will only make matters worse. We had the Waco, Texas, disaster and the Oklahoma City tragedy. Further aggressive police action by the government will only make matters worse.

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11. Adapted from an advertisement for Children, Inc. in *Time Magazine,* 12 December 1979, 12, with permission of the advertiser.

CHAPTER SEVEN

# *"That Depends on What You Mean by . . ."*

In chapter 4, we distinguished two tasks that must be carried out in the evaluation of arguments: (1) determining whether the conclusion follows from the premises and (2) determining whether the premises should be accepted. Until now, we have assumed that the words that make up our arguments are reasonably clear in their meaning. This assumption simplifies the tasks we just mentioned. As we see in this chapter, when we look at arguments whose words and phrases are unclear in their meaning, it becomes more difficult to judge whether a conclusion follows and whether to accept premises.

Often, the question of how to judge an argument seems to depend on the meaning of a word or phrase.

***Example 7.1*** *John is emotionally disturbed, and emotionally disturbed people shouldn't be allowed to own guns. So John shouldn't be allowed to own guns.*

***Example 7.2*** *Frank is not a war veteran since he fought only in Vietnam, and the conflict in Vietnam was not a war.*

***Example 7.3*** *The* Flesh.com *Web site contains images of people in sexually explicit poses. Since such images contribute to lewd desires, it follows that the* Flesh.com *Web site is pornographic.*

You can almost hear the quick replies: "That depends on what you mean by *emotionally disturbed*," "That depends on what you mean by *war*," "That depends on what you mean by *pornographic*." But if the discussion proceeds at all, it is likely to

get confused. Suppose the arguer in Example 7.1 indicates what *she* meant by *emotionally disturbed*, and according to her definition, John is emotionally disturbed. Does this save her argument? Or suppose the arguer in Example 7.2 supports his premise that "Vietnam was not a war" by insisting that a conflict is not a war unless one country officially declares war on another. Should we then accept the conclusion? Suppose the listener in Example 7.3 disagrees with the arguer's assumptions about the meaning of the word *pornographic.* Is there a way to proceed?

If there is a disagreement about meaning in any of these cases, someone will probably claim, "Now we're just arguing semantics, so there's no use in continuing." What do people mean by "just arguing semantics"? Are they making a worthwhile point? Is it true that there is no use in continuing? Can the issue of meaning be decided? How? By using a dictionary?

In an attempt to sort out and answer these questions, we note that situations in which problems with meaning arise are not all of the same kind. We distinguish three different situations in which considerations of meaning might affect our appraisal of an argument.

First, there might be a shift in meaning from one premise to the next, so that the argument's pattern is made invalid. Depending on the circumstances, this might be true of Example 7.1. The meaning of *emotionally disturbed* might shift from one premise to the next.

Second, the premises of an argument might support the conclusion only if an expression is given a special meaning. Unless this is pointed out, the argument's conclusion can be misleading. This criticism could be made about Example 7.2. The conclusion "Frank is not a war veteran" could be misleading.

Third, an argument might contain a premise that rests on a claim about the meaning of an expression. To evaluate the argument, we will need to decide whether to accept this claim about meaning. Example 7.3 could be interpreted as having the implicit premise "Material that arouses lewd desires is pornographic." And this claim could be thought to express something about the meaning of *pornographic.* How do we tell whether a claim like this should be accepted? In the remainder of this chapter we will explore each of these problems in turn.

## Unclear Expressions in the Premises: Looking for Shifts in Meaning

When an expression whose meaning is unclear is used in more than one premise, its meaning might shift from one premise to the next. If this happens, the usual result is that the conclusion does not follow from the premises. This

kind of mistake is called *equivocation*. This fallacy was introduced briefly in chapter 6. We now discuss it in greater detail.

Let's return to Example 7.1, focusing on the expression *emotionally disturbed*, which occurs in both premises.

***Example 7.1 in Standard Form***

*(1) John is* ***emotionally disturbed.***

*(2)* ***Emotionally disturbed*** *people shouldn't be allowed to own guns.*

*∴ John shouldn't be allowed to own guns.*

It might be thought that the arguer can protect the argument from criticism by saying what she means by *emotionally disturbed*. Or, if the arguer is not present, perhaps we could help the argument by suggesting a definition that makes at least one of the premises true. Suppose the arguer is present and she says, "I mean by *emotionally disturbed* anyone who would score outside the normal range of the Minnesota Multiphasic Personality Inventory (MMPI) test, and John would score outside the normal range of the relevant scales."

This definition saves the truth of the first premise, but it raises doubts about the second. As long as we vaguely suppose the expression *emotionally disturbed* to apply to people with certain severe disturbances such as paranoid delusions, it is easy to accept the claim that they shouldn't be allowed to own guns. But if we accept the stipulation that *emotionally disturbed* means "anyone who would score outside the normal range on the MMPI," then the second premise becomes doubtful. This is particularly apparent when we realize that the MMPI has a scale according to which homosexuality is "outside the normal range." It is implausible to maintain that sexual preference alone is relevant to whether people should own guns. The problem is not that the second premise remains vague, but that it is probably false if *emotionally disturbed* is stipulated to mean "anyone who would score outside the normal range on the MMPI."

The lesson from this example is important, and it can be applied in many instances of criticism. When an expression is used in more than one premise, it must have the same meaning in all premises (unless the structure of the argument does not depend on these terms having the same meaning).[1] When the meaning shifts in structurally relevant ways, the pattern of the argument is destroyed, and the conclusion does not follow from the premises. If *emotionally disturbed* kept the

1. We have to add this qualification to handle special cases such as those involving two distinct meanings for a single word. Take, for example, the argument: "Don't build your bank near the bank of the river, it floods over its banks regularly, and your bank would be open to substantial damage." This argument is *not* faulty even though there is a (harmless) shift between the two meanings of *bank*.

same meaning throughout the argument, the argument would have a pattern in which the conclusion follows:

*(1) John is a $P_1$.*
*(2) All $P_1$'s are $P_2$'s.*

*∴ John is a $P_2$.*

But if *emotionally disturbed* shifts its meaning, then the pattern becomes one in which the conclusion does not follow:

*(1) John is a $P_1$.*
*(2) All $P_3$'s are $P_2$'s.*

*∴ John is a $P_2$.*

As a second example of equivocation, consider the following reconstruction of an argument from Exercise set 4.4. We'll focus on the expression s*ignificant effect*.

***Example 7.4***

*(1) If the United States were democratic, each citizen's opinion would have a* ***significant effect*** *on government.*
*(2) Each citizen's opinion does not have a* ***significant effect*** *on government.*

*∴ The United States is not really democratic.*

*Significant effect* could mean many things, but let's try to interpret it in a way that makes both the premises of this argument plausible. In premise 2, having a *significant effect* might be taken to mean having the government do what each person wants it to do. It is certainly true that each person's opinion doesn't have this kind of effect. But if we interpret *significant effect* in this same way in premise 1, then that premise becomes completely implausible. If we refused to call the United States a democracy unless the government did what each individual wanted, then we are requiring something that is impossible.

On the other hand, we could make premise 1 plausible by interpreting *significant effect* in a more modest way, requiring only that citizens be allowed to vote and have their vote counted. But then premise 2 becomes false.

The question is whether there is some interpretation of *significant effect* that makes both these premises true, and this is beginning to appear doubtful. Unless there is such an interpretation, Example 7.4 involves equivocation.

The way we dealt with Examples 7.1 and 7.4 suggests a three-step procedure for judging whether an argument is guilty of equivocation:

**Three-Step Procedure for Judging Equivocation**

1. Locate any unclear expressions that occur in more than one premise.
2. Determine what the expression must mean to make one of the premises true.
3. Determine whether the other premise(s) can be made true without changing the meaning of the unclear expression.

## The Possibility of Misleading Definition

A slightly different problem can arise when an unclear expression occurs both in a premise and in the conclusion, and a different critical approach is required. The way the expression is used in the premise can give it a special meaning. If we interpret the expression as having its ordinary meaning in the conclusion, then the conclusion is misleading. Suppose it is argued that:

***Example 7.5***

*(1) The average height of women in the United States is five feet five inches.*

*(2) Any woman over the average height for women in the United States is tall.*

*(3) June is five feet five and one-half inches tall.*

*∴ June is tall.*

This problem is not one of equivocation. The meaning of *tall* need not shift in order to make both premise 2 and the conclusion true. The problem is that the definition of *tall* that would make premise 2 true is not a definition that would ordinarily be assumed if we heard someone referred to as "tall." So if the arguer proceeded, on the basis of this argument, to go around preparing people to meet a tall woman when they meet June, these people would be misled.

A fruitful way of criticizing this kind of argument is to point out to those presenting it that they should simply substitute their stipulated definition for the unclear term in the conclusion. We could suggest, "If all you mean by *tall* is 'above the average height for women in the United States,' then why not simply say June is slightly above average height?"

The same critical approach could be used with Example 7.2:

***Example 7.2 in Standard Form***

*(1) Frank fought only in Vietnam.*

*(2) The conflict in Vietnam was not a war.*

---

*∴ Frank is not a war veteran.*

To keep the meaning of *war* from shifting, we must take it to mean "declared war." But it would be misleading to make this assumption and at other times, without explaining the stipulation, to claim that Frank is not a war veteran. If the arguer were required, however, to substitute the stipulated definition and say, "Frank didn't serve in a declared war," then the claim would lose its misleading effect.

## Kinds of Unclarity: Vagueness and Ambiguity

So far in this chapter, we have referred broadly to "unclear meaning." Two kinds of unclarity are commonly distinguished: vagueness and ambiguity.

**Vagueness** *Emotionally disturbed*, as used in Example 7.1 concerning who should own guns, is a typical vague expression. Where do you draw the line between people who are emotionally disturbed and people who are not? *Tall*, as it is used in Example 7.5 concerning the height of women in the United States, is another vague expression. There is no definite boundary between people who are tall and those who are not. There is a range of height, and we would not hesitate to call people at the high end of the range tall, but it is somewhat arbitrary where to draw the line between those who are tall and those who aren't. *When there is no definite boundary (as in these cases) between the objects an expression applies to and those to which it does not, the expression is vague.*

It is no particular fault of an argument that it uses vague language. Most of the expressions we use could be called vague to some degree. As we can see from the examples in this chapter, a problem can arise when an argument uses the same vague expression in more than one premise. Then the question is whether it is used *consistently.* That is, does the vague expression apply to one portion of a range of objects in one premise, but to another portion of the range in the other premise?

In Example 7.4, concerning whether the United States is a democracy, the expression *significant effect* is vague. We can imagine a range of effects that citizens could have on government, from the most slight (voting for a losing proposition) to more significant (deciding what is to be law). The problem with argument 7.4 is that, to be plausible, one premise must be taken to use *significant effect* in a way that refers to less weighty effects within this range, while the other premise refers

to more weighty effects. There is no answer to—and in this case no point in answering—the question, What does *significant effect* really mean? The question is whether *significant effect* can mean the *same* thing throughout the argument.

If a vague expression is used in a premise and a conclusion, it might be used consistently but still be misleading. As we saw in Example 7.2 concerning whether Frank is a war veteran, *war* is vague enough that it could be used to apply to declared wars exclusively. But it is misleading not to stipulate this when asserting the conclusion.

**Ambiguity** A second kind of lack of clarity is *ambiguity. An ambiguous expression has more than one meaning.* The word *dream*, for example, can mean either something hoped for or a sequence of images occurring during sleep. An expression can be ambiguous without being vague. Both meanings of *dream* are fairly precise. Or an ambiguous expression can be vague also. People might be called *educated*, for example, if they have had a good deal of formal schooling or if they have acquired considerable knowledge through their own study. But in addition to having these two fairly distinct meanings, which make the word ambiguous, it is also vague because neither meaning has a definite boundary. How much schooling (or individual study) does it take before one can be properly called *educated*?

We can contrast this kind of unclarity of meaning and the kind of "shift" in meaning that can result, to the kind of unclarity and the kind of shift that can result from vagueness. A vague expression like *tall* is unclear because of the haziness of the boundary between things that are tall and those that are not. By "shifting in meaning," we meant that a vague term like *tall* can make a shift from premise to premise in the range of objects to which it refers. In the case of ambiguity, it might be unclear which of two distinct meanings a word like *dream* should be given in a particular premise, and a word might shift from one distinct meaning to another within an argument.

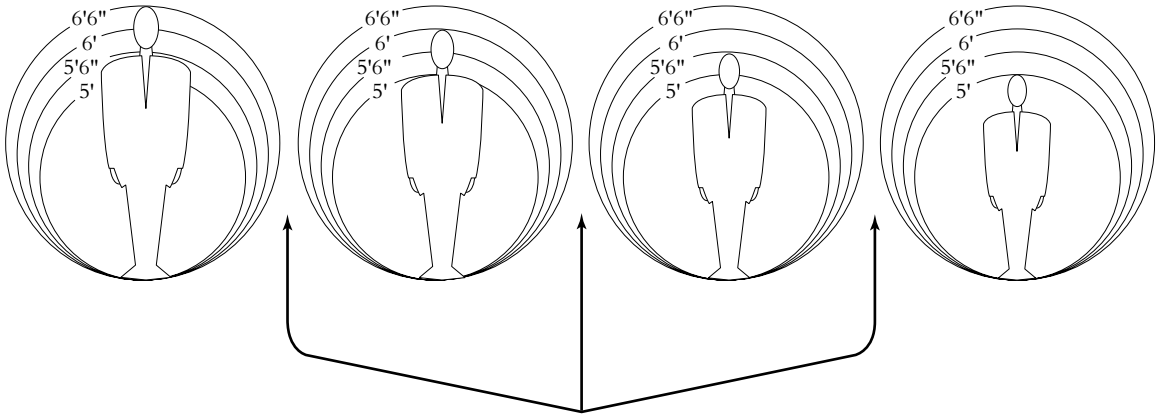
Ambiguity is less likely than vagueness to lead to difficulties in an argument. If an expression has wildly different meanings, then using it as though the meanings were the same would be too obvious to fool most listeners. Problems can arise, however, if the meanings are closely related. For example, there is a family of terms used in both legal contexts and moral contexts—*responsible, right, entitled,* and so on. It is easy to slip from one context to the other, giving these terms a slightly different meaning, as in the following argument:

***Example 7.6***

*If you bought the car from me, then I'm entitled to the money. And if I'm entitled to the money, then it isn't wrong for me to ask for it now.*

The speaker in this argument might be shifting from a legal to a moral context in using of the word *entitled*. The first statement has to do with a legal right to payment. But the person being addressed might be complaining about the ethical propriety of being asked for the money in special circumstance—being in dire

**Vagueness: Indistinct Borders for Meaning**

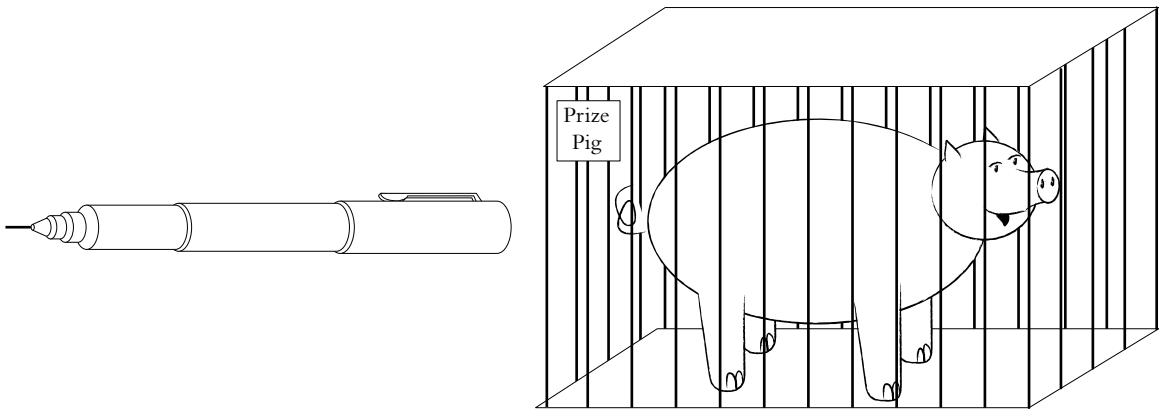



Clearly a Tall Man

Not So Clearly Tall Men—where is the boundary?

Clearly Not a Tall Man

**Ambiguity: Two or More Distinct Meanings**




Pen: an implement for writing in ink

Pen: an enclosure

need, for example, or having just been insulted by the person who is owed the money. If the first premise depends on a legal sense of *entitled*, but the second premise requires that *entitled* be used in a moral sense, then it wouldn't follow that it's permissible for me to ask for the money now. This is an example of an ambiguous expression leading to equivocation in an argument.

## Interpreting and Evaluating: A Dialogue Process

It can be seen from the discussion of these examples that when an argument contains unclear terms, the tasks of evaluating it and determining what the unclear terms mean are not separate. This point can be brought more clearly into focus through a discussion of another argument that you already attempted to criticize in Exercise 4.4. It might have been reconstructed in the following way:

***Example 7.7***

*(1) Getting married involves promising to live with a person for the rest of one's life.*

*(2) No one can safely predict compatibility with another person for life.*

*(3) If two people aren't compatible, then they can't live together.*

*(4) No one should make a promise unless she or he can safely predict that she or he can keep it.*

---

*∴ No one should get married.*

As we will see, an adequate evaluation of this argument and an interpretation of its unclear terms are two parts of a dialogue process in which each part affects the other. We call this a *dialogue process* because it simulates a dialogue that might actually occur if the author of the argument were present. We imagine the critic asking the arguer what is meant by certain expressions, and the arguer responding in turn by clarifying his or her meaning. The critic then assesses the implications of this interpretation for the argument as a whole.

It is possible simply to dismiss some of the premises in the argument given in Example 7.7 (and in many others) by interpreting vague or ambiguous expressions in ways that make the premises false. But by seeking interpretations (within reason) that will make the premises true, we can try to discover whether the argument advanced is making a point worth our consideration. This approach, which might be seen as an extension of the Principle of Charitable Interpretation, supports our objective of using critical reasoning to determine what is reasonable to believe rather than to defeat opponents in argument.

Since a written text provides no opportunity for a real dialogue, the reader must play the arguer's role as well as his or her own in interpreting and evaluating

this document. The first premise of our argument states that *Getting married involves promising to live with a person for the rest of one's life.* But the term *marriage* is broad (that is, vague) enough to cover common-law marriages and the recent phenomenon of self-styled marriage contracts that include no such promise. These cases suggest that the premise is false.

This criticism has a point; the first premise is at best misleading as stated. But it is both interesting and worthwhile to give the arguer the benefit of the doubt by interpreting *getting married* in a sense that restricts the term to cases involving the traditional vow "until death do us part" or some equivalent. This interpretation now makes the first premise true since traditional marriages do seem to involve a promise—that is, a marriage vow.

The second premise may also be subjected to the dialogue process. It states that *No one can safely predict compatibility with another person for life.* The expression *safely predict* is vague here. Would a prediction with 90 percent certainty be a safe prediction? 80 percent? 51 percent? Again, we can pick a meaning that will make premise 2 false since we can predict compatibility if we set the level of safe prediction low enough. But let us see where a more generous interpretation might lead us.

We can pick a level of certainty high enough to make the second premise true—one such that no one will be able to safely predict compatibility for life. But notice that the same expression—*safely predict*—is used again in premise 4. We must interpret it in the same way there.

Now a problem emerges. The high standards of predictability that were necessary to make premise 2 true make it less likely that *No one should make a promise unless she or he can safely predict that she or he can keep it*. We might be justified, for instance, in promising to return a book even though we know that a variety of factors, such as a house fire, might make the promise impossible to keep. To demand nearly absolute certainty of being able to keep a promise would rule out all but a few promises. Such a stipulation, if actually carried out in practice, would virtually eliminate the useful custom of making promises.

We are now left with the question of whether there is a range of "safe prediction" low enough to make this premise about promises true but high enough that it is also true that no one can safely predict compatibility with another person for life. It's doubtful that there is such a range.

There is a problem of interpretation regarding premise 3 as well. It maintains: *If two people aren't compatible, then they can't live together.* We have the same dilemma with *compatible* that we had with *safely predict*. For premise 3 to be true, we would have to call people "compatible" unless they had extremely serious conflicts. After all, many people continue to live together in spite of minor incompatibility. But by interpreting the notion of "compatible" in a liberal way, we make premise 2 less plausible—many people might be able to safely predict that they won't have serious conflicts (especially if they share a great many values and have known each other for some time). Therefore, an interpretation that makes premise 3 more plausible makes premise 2 less plausible.

What is the outcome of our dialogue process? Even being generous with the meanings of unclear terms, we judge the argument in question to be unsound—some premises are implausible. But reaching this conclusion through a dialogue process that makes every effort to find truth in the argument's premises is more important than jumping at easy ways to dismiss the argument. As an added benefit, the dialogue process has raised interesting questions about the nature of commitment in marriage. In actual practice, you need not act out a dialogue to interpret an argument. But you should try to provide a sympathetic, even generous, interpretation of crucial expressions.

The discussion of this example should have made clear how interpreting the words used in an argument, and evaluating the argument itself, are interrelated. We can often choose one of several meanings for an expression, and the choice we make can affect the truth or falsity of premises. But we must make our choices consistent to preserve the validity of an argument.

## Exercise 7.1 Criticizing Arguments That Contain Unclear Words or Expressions

1. Discuss the ways vague or ambiguous expressions might be clarified in the following statements. Suggest how assigning different interpretations affects their truth or falsity.
   a. Man is born free.
   b. Exceptional children should be given special attention by the public education system.
   c. Suicide, whether direct or indirect, should be strongly condemned.
   d. The average American family has 3.2 members.
   e. The war on poverty was no war.
   f. Marriage is a bond of trust between equals, but the partners in a marriage are rarely equal.
   g. The accused argued that he should not be required to pay the parking ticket because the sign said, "Fine for Parking" (from Mike Mailway, *Seattle Post-Intelligencer*).
   h. The public school system can never treat students equally; they come to the schools unequal in talent, experience, and family background.
   i. America did not become a democracy until the 1960s. Women could not vote until the Nineteenth Amendment was ratified in 1920, and it was only in 1965 that a Voting Rights Act was passed that did away with property qualifications and literacy tests, and paved the way for the genuine participation of all people, regardless of race, creed, or national origin.
2. Write a brief critical assessment of the following arguments, focusing particularly on possible shifts in meaning of vague or ambiguous terms. Try to create a dialogue—suggesting possible meanings of unclear terms, evaluating the

argument in the light of these stipulations of meaning, and suggesting alternative interpretations that might get around any objections. Refer to the discussion of Example 7.7 for a model of this kind of dialogue.

a. The United States is a democracy. This follows from the fact that the United States is ruled by the people and *democracy* means "government ruled by the people."
b. If the average couple has more than two children, the population will rise drastically. But we should prevent the population from rising drastically. So we should prevent the average couple from having more than two children. *(Note that this argument has been altered from the version presented in chapter 4 so that the shift in wording has been eliminated.)*
c. Space cannot be expanding unless it is finite. But space is not finite. Hence, space cannot be expanding.
d. Equal rights for women should not be constitutionally guaranteed. This follows from the fact that men and women are different physiologically and emotionally. But if this is so, then men and women are not equal. And if men and women are not equal, then they should not be called "equal" by the law.
e. Nobody should undertake college education without at least some idea of what she wants to do and where she wants to go in her life. But our world is full of change. We can't predict which fields will provide job openings in the future. If we can't confidently predict future employment, then we can't form a reasonable idea of what to do with our lives. So nobody should go to college.
f. A game is time-bound. . . . It has no contact with any reality outside itself, and its performance is its own end. Further it is sustained by the consciousness of being a pleasurable, even mirthful, relaxation from the strains of ordinary life. None of this is applicable to science. Science is not only perpetually seeking contact with reality by its usefulness, i.e., in the sense that it is applied, it is perpetually trying to establish a universally valid pattern of reality, i.e., as pure science.[2] **(Hint: Assume that the conclusion being argued is that science is not a game.)**
g. "Man is born free," said Rousseau, "and is everywhere in chains," but no one is less free than a newborn child, nor will he become free as he grows older. His only hope is that he will come under the control of a natural and social environment in which he will make the most of his genetic endowment and in doing so most successfully pursue happiness.[3] **(Hint: Assume that Skinner is arguing in this passage for the conclusion that happiness does not involve freedom from control.)**

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2. John Huizinga, *Homo Ludens: A Study of the Play Element in Culture* (Boston: Beacon Press, 1955), 203.
3. B. F. Skinner, *About Behaviorism* (New York: Knopf, 1974), 201.

## Argument and Definition

At the beginning of this chapter we pointed out that when an argument has been presented and the meanings of terms are challenged, the discussion is likely to get frustrating and confused. Some people become impatient with further discussion because they believe there is an easy resolution: a trip to the dictionary. Other people see the debate over meaning as pointless ("mere semantics") because they believe that definitions are arbitrary; anyone can use a word to mean almost anything he or she wants. We believe both points of view are mistaken.

Consider first the view that substantial problems of meaning can all be solved by consulting a dictionary. This presumption is faulty in two ways. First, dictionary entries often do little more than provide synonyms whose meaning is closely allied to the term being defined. As such, they fail to clarify meaning, as is illustrated in the following series of dictionary entries:

> **recondite**—incomprehensible to one of ordinary understanding or knowledge
>
> **incomprehensible**—impossible to comprehend; unintelligible
>
> **unintelligible**—not intelligible; obscure
>
> **obscure**—not readily understood or not clearly expressed; abstruse
>
> **abstruse**—difficult to comprehend; recondite

Second, dictionaries give precise definitions for only a limited range of scientific or technical terms. They can define precisely, for instance, specially coined terms from physics, such as:

> **pion**—a short-lived meson that is primarily responsible for the nuclear force that exists as a positive or negative particle with mass 273.2 times the electron mass or a neutral particle with mass 264.2 times the electron mass

But dictionaries give only incomplete analyses of more familiar terms:

> **marriage**—the institution whereby men and women are joined in a special kind of social and legal dependence for the purpose of founding and maintaining a family

Even if we overlook the vagueness of certain terms (*social and legal dependence, family*), this dictionary entry faces difficulty. It is inadequate because people can be married without intending to found or maintain a family (that is, without intending to have children). It is not even clear that marriage must customarily be associated with intending to have children. To fix the dictionary entry to avoid this problem, we would need to investigate more closely the connection between the concept of marriage and related concepts such as that of a family or social and

legal dependence. The latter part of this chapter examines techniques that can be used to improve our understanding of crucial concepts used in arguments. The dictionary, however, as we have seen, provides little help in resolving uncertainty about concepts.

A second perspective is taken by those who believe that discussion about meaning and definition should be dismissed because they are merely a matter of semantics. Such skeptics assume that we are free to attach whatever meaning we like to the words and statements we use, and for that reason believe that inquiry into meaning (and definition) must be fruitless.

An unlikely, but well-known, supporter of this perspective is Humpty Dumpty, as recorded in his discussion of the matter with Alice in Lewis Carroll's classic *Through the Looking Glass.*[4] They have just finished a conversation about birthdays and un-birthdays (we have 364 days for un-birthday presents).

> *"And only one for birthday presents, you know. Here's glory for you!"*
>
> *"I don't know what you mean by glory,"* Alice said.
>
> Humpty Dumpty smiled contemptuously. *"Of course you don't—till I tell you. I meant 'there's a nice knock-down argument, for you!'"*
>
> *"But 'glory' doesn't mean 'a nice knock-down argument,'"* Alice objected.
>
> *"When I use a word,"* Humpty Dumpty said, in rather a scornful tone, *"it means just what I choose it to mean—neither more nor less."*
>
> *"The question is,"* said Alice, *"whether you can make words mean so many different things."*
>
> *"The question is,"* said Humpty Dumpty, *"which is to be master—that is all."*

This snippet illustrates an extreme version of the thesis that the meaning of words reflects the momentary intentions of speakers. Alice raises the telling question of whether we *can* mean what we choose at the moment. A certain stability is necessary for communication to be possible at all. Communication is possible only if people can share meanings for the words they use and hence share concepts. If people use words as they please, with no regard for the meaning recognized by others, then they limit the amount of communication possible. Some people might be momentarily amused by a strange, unorthodox use of expressions, but they would quickly tire of the game. If you give words meaning according to a personal code, you make it virtually impossible for others to understand you. But even more generally, if the "words" (that is, sounds) people use are completely arbitrary and unsystematic, they won't even be able to begin to communicate. They won't be speaking a language but merely babbling sounds.

Of course, sometimes it is useful to specify or choose a meaning. Such specifying is commonly done within a field through its technical vocabulary; we do

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4. Lewis Carroll, *The Annotated Alice* (New York: Clarkson N. Patter Inc., 1960), 268–269.

it as well when we stipulate a meaning for a vague expression or select among the meanings of an ambiguous expression. Such choices need not be arbitrary. But extensive use of technical expressions, especially those that have nontechnical meanings as well, can make communication difficult. Learning to use words in a technical manner is like learning to use another language.

This emphasis on stability is not meant to suggest that meanings are unchanging over time, or from person to person, or group to group; people can miscommunicate. The process of examining the meaning of crucial concepts in an argument is designed to limit faulty communication. The process presupposes a certain amount of agreement between the person producing an argument and those to whom the argument is directed. If there is no such agreement on the application of a concept to even a single case (either real or imagined), then we should conclude that the people involved have different concepts—even though they might employ the same words to express them. This is what most people are prepared to do with Humpty Dumpty. His concept of "glory" is certainly not theirs (however much they might relish a "nice knock-down argument").

## Evaluating Definition-like Premises

At the beginning of this chapter we pointed to three kinds of situations in which considerations of meaning can affect our appraisal of an argument. The first two we discussed involved unclear expressions that are used more than once in an argument, raising the possibility of equivocation, or misleading definition. The comments just made concerning argument and definition are intended to clear the way for a discussion of the third kind of situation. That is, a premise of an argument might make or imply a claim about the meaning of an expression. When this occurs, a part of our appraisal of the argument is to consider whether this claim about meaning is acceptable. We have just made a case that this cannot be done by simply consulting a dictionary, but neither are meanings so arbitrary that words can mean whatever we want them to. So how do we decide whether to accept a claim concerning meaning?

Let's consider again the argument we posed at the beginning of the chapter, in which the acceptability of some premises depends on the meaning or definition of concepts.

***Example 7.3 (repeated)***

*The* Flesh.com *Web site contains images of people in sexually explicit poses. Since such images contribute to lewd desires, it follows that the* Flesh.com *Web site is pornographic.*

or in standard form:

*(1) The* Flesh.com *Web site contains images of people in sexually explicit poses.*

*(2) Images of people in sexually explicit poses arouse lewd desires.*

***(implicit)*** *(3) Any material that arouses lewd desires is pornographic.*

∴ *The* Flesh.com *Web site is pornographic.*

Imagine how we might explore the truth of these premises. We could test premise 1 by looking at the Web site to see whether they contain pictures of people in sexually explicit poses. Premise 2 is more difficult to assess. Presumably it depends at least on some sort of psychological investigation. Such a claim might well rest on the observations and theories of psychologists concerning the causes of "lewd desires." Thus premises 1 and 2 can both be easily interpreted as needing justification that appeals to features of the world and, either directly or indirectly, to observation of it. The term *empirical* is often used to mark this dependence. Premise 3, on the other hand, is more a matter of definition. Appeal here is to the meaning of the concept of pornography. Further, part of the process of assessing the truth of not only premise 3, but premise 2 as well, depends on making clear the meaning of *lewd desires*.

In deciding whether to accept the premise *Any material that arouses lewd desires is pornographic*, we could simply test it like any other universal generalization—we could try to find a counterexample to it. We could, for example, point out that for some people who are readily inclined to lewd desires, almost anything remotely related to sex could arouse such desires—pictures of fully clothed but physically attractive people, for example. For someone not disposed to lewd desires, material that many would call "pornographic" might only arouse disgust.

In many situations in which a definition-like premise is to be evaluated, this sort of testing by counterexample will probably suffice. But our discussion of the inadequacy of dictionary definitions raises a deeper question than how to determine whether a particular claim about meaning is acceptable. We might wonder how a particular claim could be supported—what kind of theory would provide a basis for a claim about the meaning of *pornographic*, or of *lewd desires*, or of any other concept. To address this deeper question, we present the following analysis of conceptual theories.

## Conceptual Theories

Conceptual theories are seldom stated fully and explicitly in ordinary argumentative passages or discourse, although they are common in such disciplines as philosophy, logic, and mathematics, where conceptual clarity is essential. In those disciplines, a conceptual theory will be offered where there is conceptual uncertainty. A philosopher wonders

which laws are just and which objects should be considered works of art. A logician wonders which arguments should be considered acceptable. A mathematician wonders how to give an account of a concept such as "finite number."

We are also called on to make conceptual distinctions in ordinary, less formal contexts. The local community wants to encourage recycling, cut down on the amount of material sent to the local landfill, and generate usable compost. It announces that "lawn and garden wastes" can be brought to a specified site. What are lawn and garden wastes? If someone brings a broken water heater, that is clearly outside the boundaries of the concept. Leaves, grass clippings, and old tomato plants are clearly within it. What about pesticide containers and old fertilizer bags? What about large tree limbs or stumps? Even though the pesticide containers and fertilizer bags are wastes attendant to the lawn and garden, they pose a danger to those who would use the compost and would for this reason be inappropriate. The limbs and stumps, though recyclable in the long run, take such a long time that, without special processing, they too would be inappropriate. The town could articulate more fully the requirements for using the recycling facility. They might add that the site is for "recyclable vegetable matter from lawns and gardens." This might help, at least if the citizens were clear about what counted as recyclable vegetable matter. They might even specify it in more detailed ways—for example, require that it be less than one inch in diameter and three feet in length.

This example suggests some important features of conceptual reasoning that apply not only in the more abstract speculation of philosophers, logicians, and mathematicians, but in more everyday contexts. First, we had some clear cases in mind: water heaters were out (though they might be recyclable in a different project); leaves and grass clippings were in. Furthermore, we might raise issues that would help decide less clear-cut cases—for instance, trees and stumps. In trying to clarify the concept, we face the danger that our attempt might not be illuminating, if for instance, the public doesn't already have an idea of what "recyclable vegetable matter" might be. Finally, we might want to make somewhat arbitrary decisions on borders for ease of use. If a one-inch-diameter branch is acceptable because it would decay in a reasonable amount of time, a one-and-one-eighth-inch branch would not take much longer. The exact point at which one draws the boundary might not be critical, though having a boundary might be necessary for actually using the concept as a tool for admitting waste into the public compost pile. If the context changed, for example, if the city bought a wood chipper—then the boundary for acceptable wastes might be altered significantly.

We borrow the model of conceptual theory[5] from the disciplines of philosophy, logic, and mathematics in order to set out a systematic way of reconstructing

5. We use the uncommon expression *conceptual theory* (rather than the term *definition*) for the full account of the meaning of a concept, in order to distinguish it from a simple dictionary definition.

definition-like claims found in arguments, even everyday arguments, and as a way of seeing what these claims look like when fully articulated. This way of reconstructing these claims also helps promote critical assessment. In later sections, we suggest several techniques for criticizing conceptual theories and tie these criticisms into the larger task of reconstructing and criticizing whole arguments.

## A Model for Conceptual Theories

Ideally, a conceptual theory designates precisely the conditions under which a certain concept applies to an object. Some conceptual theories (not necessarily adequate ones) might be:

***Example 7.8*** *A film is pornographic if and only if it explicitly depicts the sex act.*

***Example 7.9*** *A law is just if and only if it is passed democratically.*

***Example 7.10*** *An object is a work of art if and only if*

*(1) It is made by humans.*

*(2) It resembles an object in nature.*

*(3) It is beautiful.*

***Example 7.11*** *An argument is valid if and only if the conclusion follows from the premises.*

Often it is not an isolated concept that is unclear, but rather a group of related concepts. In such a case, a conceptual theory tries both to state the way the concepts are related and to designate which objects are to be included under each of the concepts. For example, an ethical theory might try to explain what acts are right, what things are good, and the relation between right and good, in the following way:

***Example 7.12*** *An act is right if and only if it produces more good than any alternative.*

*Something is good if and only if*

*(1) It is happiness;*

*OR*

*(2) It produces happiness.*

Each of these theories is stated in a standard form useful for clearly expressing conceptual theories. The part of the statement that comes before *if and only if* indicates what is being explained: the use of a certain concept in a certain con-

text. The word or phrase designating the concept is underlined in these examples. This first part of the statement, before *if and only if,* also indicates the context. In Example 7.8, the conditions under which the concept of *pornography* applies to any film are being explained. In Example 7.9, the concept of *justice* is being explained in the context of law. The theory explains the conditions under which a law is just. In Example 7.10, the context is not limited. What is being explained (not necessarily adequately) are the conditions under which the concept of *being an artwork* can apply to any object whatsoever.

The middle phrase in each stated theory—*if and only if*—indicates that what follows is a set of *requirements, or conditions to be met;* these select precisely those objects to which the concept applies. The part of the statement following *if and only if* is the list of requirements or conditions. The theory in Example 7.10 claims that the conditions an object must meet to be a work of art are:

1. It is made by humans.
2. It resembles an object in nature.
3. It is beautiful.

It is claimed that, taken by itself, each condition is necessary, in the sense that an object *must* meet this condition to be a work of art. There may be other conditions as well, but nothing can be a work of art without satisfying this one. For instance, the theory in Example 7.10 claims that it is necessary for an object to be made by humans to be a work of art. But each condition by itself is not enough to make the object a work of art. All the conditions must be met in order for an object to qualify fully as art. In this sense, while each condition is *necessary,* the entire list of conditions is said to be *sufficient* to ensure that an object is a work of art.

The preceding discussion might be misleading in that it represents conceptual theories as being rather simple, brief formulations standing by themselves; nothing has been said about the context in which a conceptual theory is developed. Typically, a conceptual theory is not offered in isolation from a discussion of (1) why it was chosen, (2) what alternatives were considered and why they were rejected, (3) how the analysis in question is related to a broader area of inquiry, and (4) further conclusions or implications that can be drawn from it. Example 7.12, for instance, is a simplification of an ethical theory that has been the focus of attention in hundreds of books and essays. In these writings, a rationale for choosing this theory over others is carefully discussed. Possible objections to the account are raised, and the reasons for overriding the objections are presented. The analysis or theory of valid arguments, introduced in chapters 2 to 5, has been developed through ongoing work in the field of symbolic logic.

Much of the development of a conceptual theory takes place in the context of the dialogue process discussed in this chapter. In such a dialogue an

inadequate account is rejected and a stronger one is constructed to meet objections. You will understand this process better after we explain how a conceptual theory is criticized.

## Reconstructing Fragmentary Theories

In an ideal case (in a careful philosophical essay, for example), a conceptual theory will be presented completely and precisely. If it is not presented in the form we have discussed, it is at least apparent how the theory will fit into this form. In less formal discourse, however, theories are sometimes presented in a fragmentary, loosely expressed manner. It is often helpful to reconstruct such a theory in order to organize the task of criticism. To do this, we determine how the writer's or speaker's statements can be fit into the form we have discussed, while both preserving the meaning and making the theory as defensible as possible.

Suppose someone has written

***Example 7.13***

*When can we consider two people to be married? This is a particularly difficult question in this age which has seen the rise of self-styled marriage contracts and even homosexual marriage. I would venture to say that marriage requires cohabitation. But it also requires having the intention of sharing love—by which, to be explicit, I mean sexual love.*

As with reconstructing an argument, a good portion of the task is eliminating remarks that are incidental. The first part of the passage conveys the difficulty of saying what marriage is, but it does not state a theory. From the second half of the passage we can elicit the following theory:

***Reconstruction***

*Two people are <u>married</u> if and only if*

*(1) They live together.*

*(2) They have the intention of sharing sexual love.*

Consider a second example that is more fragmentary and therefore requires more extensive reconstruction.

***Example 7.14***

*Some people claim that the institution of marriage has not declined. But this is due to a misunderstanding of the true nature of marriage: it is a lifelong commitment.*

Again, we must eliminate remarks that are not a part of the theory. The first statement in this example is not part of the conceptual theory being reconstructed, although it presents the position the author is criticizing. On the basis of the second statement, however, we could take the writer to be asserting

***Reconstruction 1*** *Two people are married if and only if they have made a lifelong commitment.*

But we should presume that the writer is more reasonable than this. First, the writer probably has in mind not just any commitment, but the specific commitment to live together. Second, the writer probably sees this as only one condition necessary for marriage—so that, for example, two brothers or sisters would not necessarily be married just because they had made a lifelong commitment to live together. Often, fragmentary theories present only the most important or controversial conditions. In this case, since the writer has not spelled out the remaining necessary conditions, we should reconstruct only the incomplete theory:

***Reconstruction 2***

*Two people are <u>married</u> if and only if*

*(1) They have made a lifelong commitment to live with each other;*

*AND*

*(2) other (unspecified) conditions.*

We can also use a somewhat similar pattern of reconstruction when we interpret a passage as setting out one of several possible conditions sufficient for us to apply a concept.

***Example 7.15*** *All people born within the boundaries of the United States are U.S. citizens.*

This can be reconstructed by adding "OR other (unspecified) conditions."

***Reconstruction***

*A person is a <u>U.S. citizen</u> if and only if*

*(1) He or she is born within the boundaries of the United States;*

*OR*

*(2) other (unspecified) conditions (for example, he or she is born abroad of parents who are U.S. citizens).*

You may find it easier to see the kinds of glaring weaknesses that should be avoided in reconstructing fragmentary theories after we examine the kinds of criticisms that can be made against conceptual theories. We turn to this topic in the next section.

## Exercise 7.2 Reconstructing Conceptual Theories

Reconstruct the conceptual theory presented in each of the following passages and present it in the form illustrated in the text. In each case, begin by asking what concept is being discussed in the passage. The words designating this concept should be underlined. Second, look for the condition(s) that explains the concept. The condition(s) should be listed after the phrase *if and only if.* Try to

make your statement of conditions as brief as possible. This may require substantial summarizing and rephrasing of some passages. Eliminate any irrelevant material and be as charitable as possible.

1. It is easy to see that squares are precisely those figures with four sides of equal length.
2. Much of the trash hung in art galleries these days is not really art, for to be art something must represent an object found in the real world.
3. It cannot be argued whether this law is just. It is obvious that it is just, since it was passed democratically.
4. Many questions of ethics could be resolved if people would be mindful that an act is right if it produces happiness and wrong if it produces unhappiness.
5. Traffic gridlock is a total standstill of traffic for at least fifteen minutes extending eight blocks or more in any direction.[6]
6. A family is a group of persons of common ancestry living under the same roof.
7. A work of art can be characterized by noting two features. First, works of art are the product of man's activity, i.e., they are artifacts. But unlike most tools, which are also artifacts, a work of art is an artifact upon which some society or sub-group of a society has conferred the status of candidate for appreciation.[7]
8. There are certain indicators of humanhood, included among them are an IQ of at least 20 and probably 40, self-awareness, self-control, a sense of time, and the capability of relating to others.[8]
9. The "positive" sense of the word "liberty" derives from the wish on the part of the individual to be his own master. I wish my life and decisions to depend on myself, not on external forces of whatever kind. I wish to be the instrument of my own, not of other men's acts of will. I wish to be a subject, not an object; to be moved by reasons, by conscious purposes which are my own, not by causes which affect me, as it were, from outside. I wish to be somebody, not nobody; a doer—deciding, not being decided for, self-directed and not acted upon by external nature or by other men as if I were a thing, or an animal, or a slave incapable of playing a human role, that is, of conceiving goals and policies of my own and realizing them.[9]

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6. Adapted from *Science 84* (October 1984): 84.
7. Adapted from George Dickie, "Defining Art," *American Philosophical Quarterly* 6 (1969): 253–255.
8. Adapted from Joseph Flecher, "Indicators of Humanhood: A Tentative Profile of Man," *Hasting Center Report* 2(5) (November 1972).
9. Isaiah Berlin, "Two Concepts of Liberty," *Four Essays on Liberty* (Oxford: Oxford University Press, 1958), 16. Reprinted with permission.

## The Criticism of Conceptual Theories

Some of the most effective ways of criticizing a conceptual theory are:

1. Presenting a counterexample.
2. Pointing out that the theory uses concepts that are as difficult to understand as the concept being explained (that is, the theory *does not elucidate*—it does not make things clear).
3. Showing that the theory contains incompatible conditions.

The application of these techniques can be illustrated by considering some examples. Suppose someone offers the following theory to explain what things qualify as works of art.

***Example 7.16***

*An object is a work of art if and only if*

*(1) It is made by an artist.*

*(2) It expresses the emotions of the artist.*

**Criticism 1: Presenting a Counterexample** The first kind of criticism—presenting a counterexample—was introduced in chapter 4. It can be done in either of two ways. First, an object that clearly *is* a work of art but does not satisfy the two conditions stated can be described. Or second, an object can be described that clearly is *not* a work of art but *does* satisfy the two conditions. The theory asserts that these two groups of objects are equivalent; either kind of counterexample just described shows that they are not.

Something that is a work of art but does not satisfy both conditions is a painting with a purely geometrical design, expressing no emotion whatsoever. This would fail to satisfy the second condition. Something that would not count as a work of art but *would* satisfy the two conditions would be a note written by an artist demonstrating affection or hostility inartistically.

Although we have provided two counterexamples, even one clear case is enough to show that a conceptual theory is inadequate. No matter how many instances are covered by it, a full-fledged conceptual theory does not merely describe the characteristics of *some* of the objects that fall under a concept. Such a theory would not be particularly interesting. A conceptual theory ideally states that a concept applies to *all and only* those objects having certain specified characteristics.[10]

10. There is a related criticism that notes the "inapplicability" of a concept in a particular domain. We could, for instance, have an interest in studying political behavior of legislators who are resistant

**Criticism 2: Showing That a Theory Fails to Elucidate** The second kind of criticism points out that the theory uses concepts as difficult to understand as the concept being explained (that is, the theory fails to elucidate). As in the case of criticizing an argument for lack of clarity, this criticism should not be overused. It is always possible to quibble about terms and to claim that a certain term has not been defined. What is more interesting to point out is that a person who did not already understand the concept being explained would not understand the explanation being offered. For instance, in the theory presented as Example 7.16, the term *artist* is used in the explanation of what a work of art is. To apply the theory to determine what things to count as works of art, we need to know what an artist is. But if we really did not know what things to count as works of art, we most likely would not know which people to count as artists either, so the theory is not very helpful.[11] For this kind of criticism to be justified, it is not necessary for a theory to use a concept as closely related to the one being explained as "artist" is to "art." For example, if someone were to explain the concept of "morally right action" simply as "an action that has good consequences," it would be appropriate to point out that "good" is a concept that is not clearer than "right," so if the theory is going to explain "right" in terms of "good," the theory should also explain what things are good.

**Criticism 3: Showing That Conditions Are Incompatible** The third kind of criticism is typically useful when a conceptual theory specifies more than one condition or is part of an elaborate conceptual analysis that focuses on several concepts. In these cases there may be conflict. In the more extreme instance, we can derive an explicit *contradiction* from the theory with the addition of some noncontroversial definitions or conceptual statements.

***Example 7.17***

*Capital punishment is morally justified if and only if*

*(1) It takes the life of a person who deserves to die;*
*AND*
*(2) It does no harm (to anybody).*

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to change and offer the following "stipulative" definition: *A legislator is* refractory *if and only if he or she refuses to admit any grounds for changing policy.* The problem here is not so much that we have a counterexample, but that given this stipulation it is unlikely that any actual legislator is *refractory*. The concept is inapplicable to the "real" world of actual legislators.

11. A particularly vivid example of this failing arises if someone characterizes a work of art as the product of an artist and goes on to characterize an artist as a person who produces a work of art. Such a process is clearly circular and does not help to explain what a work of art is. For this reason, these so-called "circular definitions" should be avoided.

Even if an adequate elucidation is provided for the concept of "deserving to die," this example faces a further liability: the condition leads to a contradiction.[12] Since taking the life of a person is quite plausibly held to do the person *harm,* the statement *Capital punishment does harm* follows from condition 1. This explicitly contradicts condition 2 in that *both cannot be simultaneously true, and one or the other must be true.*

It is unusual to find an explicit contradiction following so easily from the analysis of a single concept. More often it is present in ambitious attempts to analyze several interrelated concepts. Imagine a complex passage that contains, among other things, conceptual theories that can be reconstructed as follows:

***Example 7.18***

*An aggregation of people is a society if and only if most people are committed to common norms and cultural ideals.*

*America is an anomic society if and only if*

*(1) It is a society;*

*AND*

*(2) Most of its members are uncommitted to common norms and cultural ideals.*

Once these conceptual theories are placed next to each other it is easier to see the incompatibility of the conditions for an *anomic society.* Condition 1 by virtue of the definition of a society implies:

*(1) Most Americans are committed to common norms and cultural ideals.*

but condition 2 states:

*(2) Most Americans are uncommitted to common norms and cultural ideals.*

Again we have an explicit contradiction. Either most Americans are or are not committed, but not both. Such an incompatibility makes the proposed analysis of the two concepts unacceptable. Should we want to modify our analysis, we could alter either our theory of the concept of a society or, in this case, more plausibly alter our analysis of an *anomic society* to allow that a society can be anomic when a "substantial fraction" (though not necessarily most) of its members are uncommitted to common norms.

Attempts at conceptual theory can have incompatible conditions even when they do not entail explicit contradictions. The conditions might entail *inconsistent* statements. Two inconsistent statements cannot both be true, but unlike contradictions, neither statement in an inconsistent pair need be true. To say something

12. As we indicated in chapter 5, a contradiction is sometimes represented as any pair of statements of the form *A and not A.*

is "all red" is inconsistent with saying that it is "all blue." However, neither might be true—for example, if it is "all green." Examine this conceptual theory.

***Example 7.19***

*A character in a work of fiction is a tragic hero if and only if*

*(1) The character suffers or dies during the work;*

*(2) The character is typical of the ordinary person in the society;*

*AND*

*(3) The character exemplifies rarely realized ideals of the society.*

The theory of the tragic hero is faulty (assuming that the crucial terms can be adequately elucidated) because conditions 2 and 3 are inconsistent. It is impossible for a character to be typical of the ordinary person in a society and at the same time be highly atypical (that is, exemplify rarely realized ideals). We have an inconsistency, rather than a full contradiction, because there is the possibility that a character is neither typical nor highly atypical. A character could be uncommon, but not extraordinary. Nevertheless, this analysis of the tragic hero is unacceptable because of the inconsistency it contains.

Finally, conditions can be incompatible in a subtler way. Suppose, for example, a conceptual theory asserted that:

***Example 7.20***

*A society is just if and only if*

*(1) The liberty of citizens is maximized;*

*AND*

*(2) Wealth is divided equally.*

As they stand, conditions 1 and 2 are not contradictory or inconsistent, but it could be argued that they are incompatible because an inconsistency arises when we add other statements that are true to these two conditions. We could add, for example, the statement that given human social psychology, a continuing state of equal distribution of wealth could be maintained only if some restriction is placed on citizens with regard to their liberty to buy and sell and to spend or save. If so, condition 2 is possible only if some liberties are restricted. This shows that against the background of certain plausible assumptions about human nature, condition 2 is incompatible with condition 1. Both could not be true simultaneously *(unless human nature changed)*. Similarly, we could argue that if condition 1 were realized and the liberty of citizens was maximized, then (again given human nature as we know it) wealth could not long remain divided equally. The conceptual theory is shown to be inadequate because it characterized a just society in such a way that it is impossible for any such society to exist (at least for human beings).

**Types of Criticism for Conceptual Theories**

1. Presenting a counterexample
2. Showing that the theory fails to elucidate
3. Showing that conditions are incompatible

## Exercise 7.3 Criticism of Conceptual Theories

1. Criticize each of the following conceptual theories by finding a counterexample (actual or imagined). Counterexamples may be generated in two ways:
   (i) By describing an uncontroversial example to which the concept applies but that does not satisfy at least one condition.
   (ii) By describing an example that satisfies all the conditions, but to which the concept does *not* apply.

**Sample:** An action is morally right if and only if it is legal.

**Counterexample:**

| | | | |
|---|---|---|---|
| (i) | Jaywalking in order to give first aid | is morally right | but is *not* legal. |
| (ii) | Insulting a depressed friend to make the friend even sadder | is *not* morally right | but is legal. |

   a. A figure is a square if and only if it has four equal sides.
   b. A law is just if and only if it is passed by majority vote.
   c. A group is a society if and only if it is composed of members who live close to each other.
   d. A film is pornographic if and only if it explicitly depicts the sex act.
   e. A person is a compulsive programmer if and only if nothing for that person is worthwhile except time spent with the computer.
   f. An argument is valid if and only if it has true premises.
   g. A person is intelligent if and only if the person scores above 130 on the Stanford-Binet IQ test.
   h. An object is a work of art if and only if
      (1) It is made by humans;
   *AND* (2) It resembles an object in nature;
      (3) It is beautiful.
   i. A belief is true if and only if
      (1) It is accepted by most people;
   *AND* (2) It is supported by some evidence.

j. A society is democratic if and only if
(1) It has a constitution;
(2) It has a court system;
*AND*
(3) It has elected officials.

k. A person is courageous if and only if
(1) The person has been in a position of danger;
(2) The person acted with disregard for personal safety;
*AND*
(3) The person did so for some noble purpose.

2. For each of the following determine whether the conceptual theory should be criticized for failing to elucidate. If it should, indicate which term or terms lack clarity.

a. An argument is valid if and only if it follows from the premises.

b. An action is morally right if and only if it is the sort of action a morally upright person in possession of all the facts would choose.

c. Something is good if and only if
(1) It is happiness itself;
*AND*
(2) It produces happiness.

d. Someone is lascivious if and only if the person is wanton.

e. A policy is just if and only if it provides for a fair distribution of benefits and liabilities.

f. An object is beautiful if and only if it is aesthetically successful. An object is aesthetically successful if and only if it springs from the creative imagination.

g. A line is an arc if and only if it is part of a circle. An object is a circle if and only if it is a locus of points in a plane equidistant from a given point.

h. A group of organisms is a society if and only if its members can communicate about their wants and expectations.

i. An organism communicates with another if and only if its behavior results in the transmission of information from this other organism.

j. An object is a work of art if and only if
(1) It is an artifact;
*AND*
(2) Some society or subgroup of a society has conferred the status of candidate for appreciation on it.[13]

k. An object is appreciated if and only if, in experiencing it, someone finds it worthy or valuable.

l. A book is pornographic if and only if
(1) It offends standards of decency;
*AND*
(2) It has no redeeming social value.

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13. Adapted from George Dickie, "Defining Art," *American Philosophical Quarterly* 6 (1969): 253–255.

3. For each of the following indicate whether the conceptual theory contains incompatible conditions. If so, discuss the character of this incompatibility.

   a. A society is free if and only if
   (1) Everyone is permitted by the society to do as he or she pleases;
   *AND*
   (2) Everyone is encouraged by the society to realize his or her potential.

   b. A decision is democratic if and only if
   (1) It reflects the sentiments of the majority;
   *AND*
   (2) It protects the rights of the minority.

   c. A work of art is aesthetically successful if and only if
   (1) It would be appreciated by most people;
   *AND*
   (2) It enlarges people's aesthetic sensibilities by teaching them something new.

## Conceptual Clarification and Argument

The soundness of an argument can depend on an assertion about meaning. Consider this argument about the showing of a film.

***Example 7.21***

*The film* Last Tango in Paris *shouldn't be shown at the university because it is pornographic. It is quite explicit in its portrayal of the sex act.*

This argument can be restated as follows:

***Example 7.22***

*(1)* Last Tango in Paris *contains explicit portrayals of sexual acts.*

***(implicit)***

*(2) Any film that contains explicit portrayals of sexual acts is pornographic.*

***(implicit)***

*(3) Pornographic films shouldn't be shown at the university.*

∴ Last Tango in Paris *shouldn't be shown at the university.*

Controversy over this argument is most likely to arise concerning premise 2. Since the argument is valid, the argument's soundness hinges primarily on this premise. The conceptual theory implicit in the premise can be reconstructed in this way:

***Example 7.23***

*A film is pornographic if and only if*

*(1) It contains explicit portrayals of sexual acts;*

*OR*

*(2) Other unspecified conditions.*

First, we might criticize this theory by pointing out that it contains the expression *explicit portrayals of sexual acts*. Although this expression might not need

further elucidation in many contexts, its application is questionable in the case of *Last Tango in Paris*. That film contains, for example, little nudity but highly suggestive bodily movement. The question of whether such portrayals of sexual acts are "explicit" might be as difficult to answer as the question of whether the film was pornographic. So this theory fails to elucidate.

Second, we could hold that condition 1 is not a sufficient condition for being a pornographic film. We could cite counterexamples, such as medical films or films having substantial redeeming social and cultural value.

To the extent that we could maintain these criticisms of the conceptual analysis, we have provided grounds for rejecting the premise contained in the passage cited. If this premise is questionable, the soundness of the argument that contains it is also questionable.

Conceptual theories can be related to arguments in another way. Given a conceptual analysis, we can ask about its *implications.*[14] Its implications are *those conclusions* that can be drawn from it indirectly, with the addition of some set of obvious premises. Suppose we have the conceptual theory:

***Example 7.24***

*A group is a society if and only if*
*It is composed of members who live close to each other.*

One implication of this analysis is that the American Chemical Society is not a society. This is shown by the argument:

***Example 7.25***

*(1) A group is a society if and only if it is composed of members who live close to each other.*

*(2) American Chemical Society members do not live close to each other.*

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*∴ The American Chemical Society is not a society.*

A second, obvious implication would be that the increased mobility of people in a society would result in the group becoming smaller. Here again, if we wished to spell this out in detail, we could construct an argument in standard form that would have as a conclusion: *If a society increases its mobility, then it will become smaller.*

We could generate indefinitely many such arguments using the conceptual analysis as a premise. These would be the implications of the conceptual theory in a technical sense, but the term *implication* is often limited to just those conclusions that can be drawn with the help of obvious or relatively uncontroversial supplemental assumptions.

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14. We introduced the term *implication* in chapter 4. Our discussion here explains it more fully.

## Exercise 7.4 Reconstructing and Criticizing Conceptual Theories and Arguments Based on Them

1. This exercise will give you the opportunity to apply all the techniques of reconstruction and criticism you have learned in this chapter. For each of the following passages, write a paragraph or two in which you first present a reconstruction of the conceptual theory, then apply all criticisms that are appropriate. Several passages were presented earlier for reconstruction only.

   a. Listen then, Thrasymachus began. What I say is that "just" or "right" means nothing but what is to the interest of the stronger party. Well, where is your applause? . . . [15]

   b. Love is a deep and vital emotion resulting from significant need satisfaction, coupled with a caring for and acceptance of the beloved and resulting in an intimate relationship.[16]

   c. Any adequate account of morality must concern itself with both what is right and what is good. They are related in this way; a morally right action produces more good than any available alternative. But this leaves open the question of just what counts as good. Ultimately the goodness of something must be measured in terms of the pleasure it produces in normal individuals.

   d. A work of art can be characterized by noting two features. First, works of art are . . . artifacts [made by humans]. But unlike most tools, which are also artifacts, a work of art is an artifact upon which some society or sub-group of a society has conferred the status of candidate for appreciation.[17]

   e. There are certain indicators of a humanhood, including among them an IQ of at least 20 and probably 40, self-awareness, self-control, a sense of time, and the capability of relating to others.[18]

   f. Family: Any sexually expressive or parent-child relationship in which people live together with commitment, in an intimate interpersonal relationship. Family members see their identity as importantly attached to the group, which has an identity of its own.[19]

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15. Plato, *The Republic,* I.338, trans. Francis Cornford (Oxford: Oxford University Press, 1945).
16. Mary Ann Lamanna and Agnes Riedmann, *Marriages and Families*, 5th ed. (Belmont, CA: Wadsworth, 1994), 86.
17. Adapted from George Dickie, "Defining Art," *American Philosophical Quarterly* 6 (1969): 253–255.
18. Adapted from Joseph Flecher, "Indicators of Humanhood: A Tentative Profile of Man," *Hasting Center Report* 2(5) (November 1972).
19. Mary Ann Lamanna and Agnes Riedmann, *Marriages and Families,* 5th ed. (Belmont, CA: Wadsworth, 1994), 645.

g. The "positive" sense of the word "liberty" derives from the wish on the part of the individual to be his own master. I wish my life and decisions to depend on myself, not on external forces of whatever kind. I wish to be the instrument of my own, not of other men's acts of will. I wish to be a subject, not an object, to be moved by reasons, by conscious purposes which are my own, not by causes which affect me, as it were, from outside. I wish to be somebody, not nobody; a doer—deciding, not being decided for, self-directed and not acted upon by external nature or by other men as if I were a thing, or an animal, or a slave incapable of playing a human role, that is, of conceiving goals and policies of my own and realizing them.[20]

h. [The original position] is understood as a purely hypothetical situation characterized so as to lead to a certain conception of justice. Among the essentials of this situation is that no one knows his place in society, his class position or social status, nor does anyone know his fortune in the distribution of natural assets and abilities, his intelligence, strength, and the like. I shall even assume that the parties do not know their conception of the good or their special psychological propensities. The principles of justice are chosen behind a veil of ignorance. . . . I shall maintain . . . that the persons in the initial situation would choose two rather different principles; the first requires equality in the assignment of basic rights and duties, while the second holds that social and economic inequalities, for example inequalities of wealth and authority, are just only if they result in compensating benefits for everyone, and in particular for the least advantaged members of society. . . .

The first statement of the two principles reads as follows.

First: each person is to have an equal right to the most extensive basic liberty compatible with a similar liberty for others.

Second: social and economic inequalities are to be arranged so that they are both (a) reasonably expected to be to everyone's advantage, and (b) attached to positions and offices open to all.[21]

2. The following passages contain arguments that depend on definitions or conceptual analyses. (1) State the underlying conceptual theory on which the argument depends. (2) Reconstruct the argument. (3) Criticize the argument by criticizing the underlying conceptual analysis.

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20. Isaiah Berlin, "Two Concepts of Liberty," *Four Essays on Liberty* (Oxford: Oxford University Press, 1958), 131. Reprinted with permission.

21. John Rawls, *A Theory of Justice* (Cambridge, MA: Harvard University Press, 1971), 12, 14, 60.

a. The Museum of Modern Art in New York City shouldn't show any of the French Impressionists. Its mandate is to collect and exhibit the best of modern art, but the French Impressionists painted during the nineteenth century.
b. People shouldn't be given capital punishment for treason. The state is justified in taking a life only as a penalty for murder. Since treason involves no killing, a traitor doesn't deserve the death penalty.
c. Since a valid argument is a good argument, all valid arguments must have a true conclusion.
d. Public sale of pornography violates the civil rights of women. Pornography involves the sexually explicit exploitation of women whether graphically or in words. As such, it promotes the sexualized subordination of women.
e. The hope of computer scientists to create Artificial Intelligence is misguided. Computers must be programmed. If they're programmed, they can't be creative. If they're not creative, then they can't be intelligent. Perhaps *artificial* intelligence is the correct term. Computer intelligence must remain artificial, not genuine.
f. QUESTION: Do you agree with me that the statement, "I was never alone with her," is incorrect? You were alone with Monica Lewinsky, weren't you?

   CLINTON: Well, again, it depends on how you define *alone*. Yes, we were alone from time to time, even during 1997, even when there was absolutely no improper contact occurring. Yes, that is accurate.

   But there were also a lot of times when, even though no one could see us, the doors were open to the halls, on both ends of the halls, people could hear. The Navy stewards could come in and out at will, if they were around. Other things could be happening. So, there were a lot of times when we were alone, but I never really thought we were.

   And sometimes when we, when—but, as far as I know, what I was trying to determine, if I might, is that Betty was always around, and I believe she was always around when I could basically call her or get her if I needed her.

   QUESTION: When you said to Mrs. Currie you could see and hear everything, that wasn't true either, was it, as far as you knew? You've already . . . testified that Betty was not there.

   CLINTON: My memory of that was that, that she had the ability to hear what was going on if she came in the Oval Office from her office. And a lot of times, you know, when I was in the Oval Office, she just had the door open to her office. Then there was—the door was never completely closed to the hall. So, I think there was—I'm not entirely sure what I

meant by that, but I could have meant that she generally would be able to hear conversations, even if she couldn't see them. And I think that's what I meant.[22] **(Reconstruct an argument involving a definition of "alone" suggested in this passage that has the conclusion "I was never alone with her.")**

3. Trace some of the implications of the conceptual theories implicit in the following passages and reconstruct the argument leading to the implications you cite.

   a. Being a work of art is not some objective characteristic of a thing like its color or shape, nor is it merely a matter of individual taste. Rather, an object becomes a work of art by being put in contention as a candidate for appreciation by people who constitute the art world—those whose life and social relations are dedicated to creating, identifying, assessing, and evaluating objects as works of art.

   b.

Four ingredients are essential for a revolution. There must be a vision easily grasped by the majority. The vision must be credible. There must be widespread faith and conviction that the vision can be achieved. The new order promised by the vision must be perceived as better than the current order. I believe all these ingredients are present in the changes occurring now during this time we sometimes call "The Computer Revolution."

**Revolutionary Ingredients**

The four basic ingredients of revolution are present. First, the basic vision—machines behaving intelligently—is easily grasped by the majority. Who can fail to understand the concept of a personal doctor machine? A personal lawyer machine? A personal banker machine? An assembly line robot?

Second, the basic vision is credible. Fifteen years ago, hand calculators were curious toys; now they fit in watches. A $200 box transforms an ordinary TV set into a deep-space battleground. Desk top computers come with advanced interactive graphics. Some of these machines have synthetic voice output, which is a fancy way of saying they talk. Racks offering software cartridges replace record and book displays in many stores. No toys, these cartridges—some contain complete operating systems.

22. President Bill Clinton in his videotaped August 18, 1998 grand jury testimony released by Congress September 21, 1998, as found on the Oklahoma Department of Libraries Web site, http://www.odl.state.ok.us/usinfo_video/vid_5.htm.

> Third, there is faith and conviction that the vision will be achieved. In less than fifteen years, we have seen computers leap from the dark wings into center-stage prominence. Yesterday's room-filling computers have been compressed into the stems of pens; yesterday's multiman-year operating systems are duplicated like phonograph records. How big a leap of faith is required by the ordinary person to go from a $250 chess-champion machine to a personal doctor machine? Or from a block-stacking robot arm to one that builds cars? Not much. Many people believe that intelligently behaving machines are already here.
>
> Fourth, the new order is generally perceived as an improvement over the present. Who would believe that a personal doctor machine that seldom errs and costs, say $2000, is a step backwards in a time of sharply rising medical costs? Or would not help a poor country desperately in need of doctors? Who would believe that a personal lawyer machine that costs little more than a library of popular how-to law books would be a waste of time? You can be sure that there are today shrewd investors backing projects to develop such machines and bring them to market in the next decade. These investors are betting that many consumers will find such machines valuable. Another way of looking at this: Both hardware and software are now being mass-produced cheaply. Current machines and programs are of such sophistication that the average person believes the generation of intelligent machines is inevitable; it's just a matter of time.[23]

c. Since I use the term *authority,* in this book and elsewhere, in a wider sense than is common, I will say once more what I mean by it. A person accepts authority whenever he takes decision premises from others as inputs to his own decisions. Rewards and punishments provide the most obvious motives for accepting authority—especially, in organizations, the economic rewards associated with employment. But these are not the only motivating forces. Provided that a person is basically motivated to work toward the goals of an organization, much of the authority he accepts derives from the "logic of the situation." Decision premises are likely to be accepted if there is reason to believe that they are appropriate to the task and the situation. Expert advice is authoritative if it reflects the

23. Peter J. Denning, "Editorial: Childhood's End," *Communications of the ACM* 26(9) (1983): 617–618. Copyright 1983, Association for Computing Machinery, Inc. Reprinted with permission.

requirements of the situation. And a communication is frequently accepted as authoritative because it comes from an organizational source that is in a position to be "expert" for that kind of communication.

Closely related to the expertness of a source of decision premises is its legitimacy. The division of labor in an organization establishes expectations that certain kinds of decision premises will emanate from certain departments in the organization. A regulation about personnel practices has prima facie legitimacy if it comes from the personnel department.

Under some circumstances people chafe at accepting authority; under other circumstances they do not feel it as being in the least demeaning. In particular, authority is accepted more readily if it appears consistent with the logic of the situation than if it appears arbitrary or capricious. The experience of freedom and responsibility does not require complete independence from outside influence. Rather, it requires that the outside constraints and demands be understandable and reasonable. One does not feel unfree handling a sailboat, even though most of one's responses are governed by the moment-to-moment demands of wind and wave.

As the sailboat example illustrates, the physical environment is often as important a source of decision premises as are other human beings. One way to control a driver's behavior is to pass and enforce a speed law; another is to attach a governor to his motor or reduce its horsepower. Human reactions to authority are not particularly different as the authority resides in a human or in a physical source. Human beings react negatively to human authority that they view as inimical or frustrating to their goals; they also react negatively to rain at a picnic.[24]

d. **The Eolithic Alternative**

The alternative ways of focusing an evaluation . . . are relatively straightforward in conceptualization. . . . Alternative conceptualizations are important and powerful because they direct our attention toward some things and away from other things, just as goals do. New conceptualizations can be helpful in opening our minds to potentially new ways of perceiving and experiencing the world. The eolithic alternative, *partly through the very strangeness of the term*, is meant to serve this thought-provoking, awareness enhancing function. The notion of eolithism is meant to alert us to the limitations of goals-based evaluation designs, while making us aware of, not simply an alternative technique, but a totally different way of proceeding and perceiving.

The eolithic alternative was introduced into evaluation by David Hawkins. In a highly provocative paper, Hawkins draws on the work of American engineer/novelist Hans Otto Storm to differentiate the principle

24. Herbert A. Simon, *The New Science of Management Decision,* rev. ed. (1977), 120–121. Reprinted by permission of Prentice-Hall, Inc., Englewood Cliffs, NJ.

of eolithism from the principle of design. The principle of design is fundamental to logical, rational, goals-based planning, and evaluation: One must know where one is going, have ways of measuring progress toward the specified goal(s), and select those means most likely to result efficiently in successful goal attainment. An evaluation design specifies a specific purpose and focus for the evaluation, methods to be used to achieve desired evaluation outcomes, measurements to be made, and analytical procedures to be followed. Proposals are usually rated, and funded, on the basis of clarity, specificity, efficiency, and rigor of design. The principle of design is logical and deductive in that one begins with goals (a purpose and desired outcomes) and then decides how best to attain those goals, given resources known in advance (at the design stage) to be available.

The principle of eolithism, on the other hand, directs the investigator to consider how ends can flow from means. One begins by seeing what exists in the natural setting and then attains whatever outcomes one can with the resources at hand. Storm adopted the term "eolithism" for this approach in order to focus our attention on the eoliths that are available all around us, but that are often overlooked in our preoccupation with attainment of preordinate goals and our commitment to follow paradigmatically validated designs. An eolith is "literally a piece of junk remaining from the stone age, often enough rescued from some ancient burial heap. . . . Stones, picked up and used by man, and even fashioned a little for his use. . . ." The important point here is that eoliths are discovered in modern times already adapted to and suggestive of some ancient end. More generally, and metaphorically, the principle of eolithism calls to mind a child (or stone-age human) happening upon some object of interest and pondering, "Now what could this be used for?"

There are two ways in which the principle of eolithism is important to creative evaluation, and therefore, important to include in the repertoire of creative evaluators. The principle is important first as a conceptual distinction for understanding how certain programs function. Evaluations of programs operating according to an eolithic principle may be best served by evaluation approaches other than the traditional, goals-based model of evaluation—at least in terms of the standards of utility, feasibility, and propriety. Second, the principle of eolithism is important as an alternative approach to evaluation, regardless of whether the program being evaluated is eolithic in orientation.[25] **(Hint: The author is introducing the technical concept of an eolithic alternative—a way of carrying out an evaluation of programs that goes beyond seeing whether a program achieves its explicit goals.)**

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25. Michael Patton, *Practical Evaluation* (Beverly Hills, CA: Sage, 1982), 112–113. Reprinted by permission.

CHAPTER EIGHT

# *Arguments That Are Not Deductive*

In previous chapters, we have focused on how to evaluate arguments that traditionally have been called *deductive.* The primary aim of this chapter is to explain how to evaluate several kinds of arguments that are not deductive. These include arguments that are commonly called *inductive* (including sampling arguments and arguments with statistical premises), causal arguments, convergent arguments, and arguments from analogy. As we discuss how to evaluate nondeductive arguments, we will at the same time be continuing our survey of strategies for criticizing premises of deductive arguments. This is because the conclusions of inductive and other types of nondeductive arguments often serve as premises for deductive arguments.

For example, one kind of nondeductive argument, commonly called inductive, moves from a premise that cites particular observations to a conclusion that is more general.

***Example 8.1*** ***Inductive Sampling Argument (Particular to General)***

***Premise*** *(1) In studies of 5,000 people, those who had more exposure to environmental smoke had a higher frequency of lung cancer.*

***Conclusion*** *(likely) People who have more exposure to environmental smoke generally have a higher frequency of lung cancer.*

Notice that the argument moves from a premise that reports what has been observed in specific studies to a conclusion about a larger population that has not been directly observed. The term *likely* is used rather than the sign ∴ to indicate

that inductive arguments do not guarantee the truth of the conclusion. The conclusion of this inductive argument would serve as a premise in the following deductive argument:

***Example 8.2*** ***Deductive Argument (Modus Ponens)***

***Premise*** *(1) People who have more exposure to environmental smoke generally have a higher frequency of lung cancer.*

***Premise*** *(2) If (1), then we should restrict smoking in public places.*

***Conclusion*** *∴ We should restrict smoking in public places.*

In evaluating this deductive argument, we need to decide whether to accept premise 1. One way of doing this would be to evaluate the inductive argument on which this premise is based.[1]

It is useful to place arguments like 8.1 in a separate category from deductive arguments like 8.2. We reconstruct them somewhat differently, apply specifically tailored criticisms, and also employ different criteria for their success. For example, we might accept argument 8.1 as successful, even though we acknowledged that the premises could be true and the conclusion false.

In this chapter, we discuss several kinds of nondeductive arguments. The first kind moves from premises that describe *particular* observations to a more *general* conclusion (as in Example 8.1). A second kind of nondeductive argument moves from a *general* premise to a *particular* conclusion. An example is the argument *Most teachers enjoy talking, and Mario is a teacher. So Mario probably enjoys talking*. Both of these kinds of arguments are called **inductive.** In addition we examine some special cases: causal and analogical arguments as well as arguments of the type we called convergent in chapter 1.[2]

## Two Types of Inductive Arguments

We use inductive reasoning frequently in our everyday lives. Suppose Robin examines the top two layers in a container of strawberries at a local market and finds most of them delightfully ripe. Robin concludes that probably most of the berries in the whole container are ripe. Again, the premise of this argument states a particular observation, while the more general conclusion goes beyond what has been observed.

1. For a critical discussion of arguments concerning environmental smoke and cancer, see chapter 10.
2. Causal arguments resemble particular-to-general sampling arguments in some ways, and arguments by analogy resemble general-to-particular arguments. Convergent arguments were contrasted with linked deductive arguments in chapter 1.

***Example 8.3*** ***Inductive Sampling Argument (Particular to General)***

*(1) The first two layers of strawberries contain many ripe ones.*

*(likely) All layers of strawberries contain many ripe ones.*[3]

A less obvious version of this argument pattern moves from evidence about the past to a conclusion that applies not only to the past but also to the future:

***Example 8.4*** ***Inductive Argument (Past to Anytime)***
***Variation of the Sampling Argument***

*(1) In the 1960s measures to combat inflation led to increased unemployment.*

*(2) In the 1970s measures to combat inflation led to increased unemployment.*

*(3) In the 1980s measures to combat inflation led to increased unemployment.*

*(likely) Measures to combat inflation will always lead to increased unemployment.*

As in the previous example, this form of sampling argument generalizes from information about a certain sample of cases to a conclusion that goes beyond the evidence.

The conclusion of such inductive arguments is called an *inductive* or *empirical generalization*.[4] It is important to notice that a *leap* is made from premises (evidence) about particular cases to a conclusion that applies *generally*—not just to these specific instances. Not all such leaps are equally justified, and we will discuss techniques later in this chapter for criticizing inductive arguments that make them.

Both of the examples of inductive reasoning we have just considered move from *particular to general*—that is, statements about particular instances (particular layers of strawberries or particular decades) to a generalization based on them. But some inductive arguments move from *general to particular.* They contain a *statistical* generalization as a premise.[5] The argument applies this generalization to a particular person or situation and reaches a conclusion about them or it.

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3. The conclusion is asserted to be likely relative to the evidence provided in the premises. Against a wider background of evidence, the conclusion may be unlikely.

4. The process of moving from statements about particulars to a statement about a larger class that contains them is called *generalizing.* To call a statement general means that it applies to a number of individuals rather than to particular, or specific, cases. Generalizations can apply to all cases, such as *all animals with hearts have kidneys.* (These are also called *universal empirical generalizations.*) But in some contexts, generalizations can also speak of *some, a few,* or *a certain percentage of cases*—for example, *30 percent of adult Americans are overweight; some stocks are too speculative; a few TV programs are worthwhile.*

5. The term statistical is used broadly to include not only those cases in which some specific percentage is mentioned, but also premises that include some unspecific statistical terms such as *many, most, a few, seldom,* and so on, in contrast to the universal empirical generalizations that contain terms like *all, every, always, no, none,* and *never.* The universal generalizations discussed in chapter 7 are more definitional than empirical.

***Example 8.5*** ***Argument from Statistical Premises (General to Particular)***

*(1) Most 103-year-old persons who have major surgery suffer serious complications.*

*(2) Didi is a 103-year-old person who has had major surgery.*

*(likely) Didi will suffer serious complications.*

Assuming the truth of the premises, this argument provides good reasons for believing the conclusion, but like the examples discussed earlier, the truth of the premises doesn't guarantee that the conclusion will be true, but only makes it likely.

## Inductive Versus Deductive Arguments

In previous chapters we indicated that a successful deductive argument has two principal properties.[6]

1. The conclusion follows from the premises. *(If all the premises are true, it is impossible for the conclusion to be false.)*
2. The premises are true.

As we have indicated, for inductive arguments the requirements for success are somewhat different. A fully successful inductive argument has true premises, but the connection between premises and conclusion is not as strong. If the premises are true, then it is improbable or unlikely that the conclusion is false. For a deductive argument the truth of the premises assures us of the truth of the conclusion; for an inductive argument the truth of the premises makes the conclusion likely or probable, although there is always the possibility that the premises are true and (unlikely as it seems) the conclusion is false. Compare these two candidates, one billing itself as a deductive argument, the other as an inductive argument:

***Example 8.6***

| ***Deductive*** | ***Inductive Argument with Statistical Premises*** |
|---|---|
| *(1) All God's creatures need potassium in their diets.* | *(1) Most adults can tolerate moderate amounts of sugar in their diets.* |
| *(2) Alvin is one of God's creatures.* | *(2) Alvin is an adult.* |
| *∴ Alvin needs potassium in his diet.* | *(likely) Alvin can tolerate moderate amounts of sugar in his diet.* |

6. In addition, it needs to be legitimately persuasive to be fully successful, as indicated in chapter 6.

The principal difference is that if the premises of the deductive argument are true, then the conclusion must be true. But the premises of the inductive argument may both be true and the conclusion false. For example, if Alvin is diabetic, then the conclusion of the inductive argument is false, even though both premises are true.[7]

Sometimes it is fairly easy to determine whether an argument is best construed as inductive rather than deductive. You can look for indicator words associated with the conclusion such as *probably* or *likely*. As we will see, the language of sampling or polling suggests induction. But on some occasions it is difficult to determine whether the conclusion of an argument is presented by the arguer as only made probable by the premises, or whether the conclusion is presented as guaranteed by the truth of the premises. For example,

***Example 8.7*** *Fran must be pretty well off. Volvo owners have higher-than-average incomes and Fran owns a Volvo.*

***Deductive Version***

*(1) All Volvo owners have higher-than-average incomes.*
*(2) Fran is a Volvo owner.*
*∴ Fran has a higher-than-average income.*

***Inductive Version***

*(1) Most Volvo owners have higher-than-average incomes.*
*(2) Fran is a Volvo owner.*
*(likely) Fran has a higher-than-average income.*

There is no direct clue in the passage to suggest which version is intended by the arguer. If it were in an advertising brochure in a section titled "Volvo Owners Tend to Be Brighter and Wealthier," the inductive version would be more clearly indicated because of the word *tend*. Reference to tendencies in this and related contexts suggests something often (but not always) takes place. In the absence of even this type of clue, we are left only with an application of the Principle of

7. A common misconception distinguishes *in*ductive from *de*ductive reasoning by holding that induction moves from particular to general and deduction from general to particular. As examples 8.3 and 8.4 demonstrate, certain inductive arguments can move from general to particular. We can also construct deductive arguments that go from particular to general—for instance, *If Al can do it, then anybody can do it. Al can do it. So anybody can do it.*

Charitable Interpretation, which asks us to interpret the argument so that the premises support the conclusion. In the deductive version, the first premise would be hard to accept. It is difficult to believe that every single Volvo owner is well off. Some older Volvos are no doubt owned by students with relatively low incomes. To treat the passage as containing an obviously unsound deductive argument, rather than a much more plausible inductive argument, would be uncharitable. The charitable course, other things being equal, is to interpret an argumentative passage as a plausible inductive argument (one with no obvious faults) rather than as an unsuccessful (unsound) deductive argument. The author, of course, is ultimately responsible for guiding the interpretation of an argument. In some contexts you might not be able to tell whether the author intended to present a weak deductive argument or a somewhat less weak inductive argument. In either instance, however, the argument might be open to criticism.

**A More Complex Passage** More complex examples of empirical reasoning may include both types of inductive arguments—sampling (particular to general) and argument with statistical premises (general to particular)—as illustrated in the following passage and reconstruction.

***Example 8.8***

*A recent poll of a random sample of Americans of voting age indicated that 68 percent favored more strict gun control legislation. With such a large approval rating, it is only a matter of time before a balanced budget amendment is ultimately passed into law. This is because most proposed legislation that has substantial public support ultimately gains ratification.*

***Reconstruction***

***Sampling Argument (Implicit)***

*(1) Sixty-eight percent of the eligible voters sampled in the poll favored more strict gun control legislation.*

*(likely) About 68 percent of the eligible voters in America favor more strict gun control legislation.*

***Argument with Statistical Premises (Implicit)***

*(1) About 68 percent of the eligible voters in America favor more strict gun control legislation.*

*(2) Most measures supported by a large portion of the American public become law.*

*(likely) More strict gun control legislation will ultimately be ratified.*

This passage makes a prediction—more strict gun control legislation will ultimately be ratified. The conclusion of the first reconstructed argument is the premise of the second.

## Exercise 8.1 Generalizations, Descriptions of Particulars, and Inductive Arguments

1. The previous section distinguished several kinds of statements. To practice seeing differences among them, determine which of the following statements are generalizations and which are descriptions of particular states of affairs. Indicate which of the generalizations are universal (apply to all, every, no or none) and which are "statistical" (apply to some—that is, not all or none). Remember that statistical generalizations can include terms such as *most, many, few,* and *some percentage.* It might be debated whether some statements are general or particular. Provide a brief justification of your choice in these cases.

   a. Alvin bought the strawberries on June 15.
   b. Most people don't trust government.
   c. Seventy percent of the people who live in Texas like chili.
   d. Dale parties on Friday nights.
   e. Smoking is hazardous to your health.
   f. People don't get everything they like.
   g. Edna and James usually treat each other lovingly.
   h. Few people enjoy having their gallbladder removed.
   i. Alice will not go out to dinner tonight.
   j. Every animal with a heart is an animal with kidneys.
   k. Children always suffer in a divorce.
   l. Brenda voted Republican and Mike voted Democratic.
   m. Human beings do not live by bread alone.

2. Reconstruct the argument(s) in the following passages. Label them deductive or inductive. (One passage contains both kinds of argument.) Among the inductive, note which are sampling arguments (particular-to-general arguments), which are arguments with statistical premises (general-to-particular arguments), and which include both.

   a. Most people under thirty-five can jog without special precautions. Debra is young, so she can begin running right away.
   b. The outlook for education in America is bleak. Educational disaster will be avoided only if people give up their selfishness. But Americans are not willing to do that.
   c. A reporter is seldom able to get a politician to admit his or her real motives. The *Daily Herald* story about the mayor doesn't tell the whole story.
   d. Alvin should pay at least half his income in taxes because everybody who has more than a $1 million income, whether from wages or some other source, should pay at least 50 percent in taxes no matter what his or her deductions.

e. You should buy a Chevy. Jerry and David each had one and they were great cars.
f. Any time population increases in a state, the housing demand increases as well. Population has been increasing in Oregon, Washington, and California. So we can expect the demand for housing to increase in those states.
g. The mayor really doesn't care about the poor in spite of her pious pronouncements. If she were truly interested, she would be actively seeking to bring more jobs into the city.
h. Willie was late on Monday and late on Tuesday. We shouldn't expect him to be on time today.
i. It is decision time at Widget, Inc. The company president says: "Our market research department has just completed a test of the new and improved Widget in three test market areas: Dallas, Detroit, and Denver. In all three cities the consumers preferred the new Widget over the old two to one. I think we should go for it."
j. America is a democracy, and most democracies will not long permit substantial differences in wealth. Since, as recent survey data indicate, roughly 30 percent of America's wealth is owned by 2 percent of the population, it is likely that legislation to alter this distribution, at least somewhat, will be produced.
k. A recent survey indicated that the top 2 percent of the population controls 30 percent of the country's wealth. If so, a targeted marketing campaign designed to induce these individuals to buy Widgets should improve the bottom line for Widget, Inc.

## Criticizing Arguments That Generalize: Sampling Arguments

Arguments that move from particular pieces of evidence or samples to general statements can be criticized in three ways. As in the case of deductive arguments, such pieces of inductive reasoning may be shown unsuccessful (1) by indicating that some of the premises are false, that is—by *disputing the data;* (2) by showing that the conclusion does not follow—for example, because the sample is not likely to be representative of the larger population from which it is drawn. In addition, it is also appropriate at times to (3) attack the conclusion directly (independently of any argument that might be put forward to support it) by offering a *counterinstance* or *counterevidence.*

**Attacking the Premises (Disputing the Data)** One means of criticizing an argument that generalizes is by *disputing the data*—that is, showing that the "evidence" used as a basis for the generalization does not really exist or has been misinterpreted. Recall the example of Robin and the strawberries. Robin examined two layers of strawberries in a container and found many of them ripe, generalizing that many of the berries in the whole container were ripe. A person versed in new horticultural technologies could criticize this reasoning by pointing out that the berries might be the newly developed hybrid California red strawberries that have the red color of the ripe, traditional berry even when they are hard and undeveloped. This horticultural commentator is disputing Robin's interpretation of the evidence used in support of the generalization (the berries looked ripe but weren't). Of course Robin might be suspicious of such an improbable story. Observing the berries more carefully to see how hard they were might resolve the issue. The technique of criticism employed by the commentator is similar to questioning the soundness of a deductive argument by challenging the truth of a premise.[8] This first kind of criticism often requires specialized knowledge or research. The following kind of criticism can more often be made against a bad particular-to-general argument, on the basis of commonly held knowledge.

**Questioning the Representativeness of the Sample** Even if we accept the data, we can challenge some generalizations by pointing out that illegitimate reasoning is involved. Typically, generalizations go beyond the data used to support them to make claims that apply to a wider class of cases. This type of reasoning is an instance of *sampling*: the evidence about an observed sample is generalized to a larger population.

One of the most familiar instances of sampling is the political poll. Prominent pollsters, such as the Gallup and Harris organizations, try to make generalizations about the beliefs of large numbers of people. It would be time consuming and expensive (indeed virtually impossible) to question all the people who might vote in an election. Instead, the polling organization looks at a much smaller group (the *sample*), which it expects to represent the beliefs of a much larger group (the *population* of prospective voters). Just before the election 1,500 people might be polled about their presidential preferences (Figure 8.1). Let's say that 45 percent of the people who indicate that they are planning to vote prefer candidate A, 47 percent prefer candidate B, and 8 percent are undecided. The polling organiza-

8. Perhaps a more plausible criticism of Robin's reasoning could be given by a cynical consumer advocate, who might point out that fruit vendors sometimes put the unripe, green fruit at the bottom of the container. Such a comment concerns whether the top layers are representative of the whole container. The next section considers this kind of criticism.

tion would be prepared to generalize from its sample to the whole voting population (perhaps 100 million people).[9]

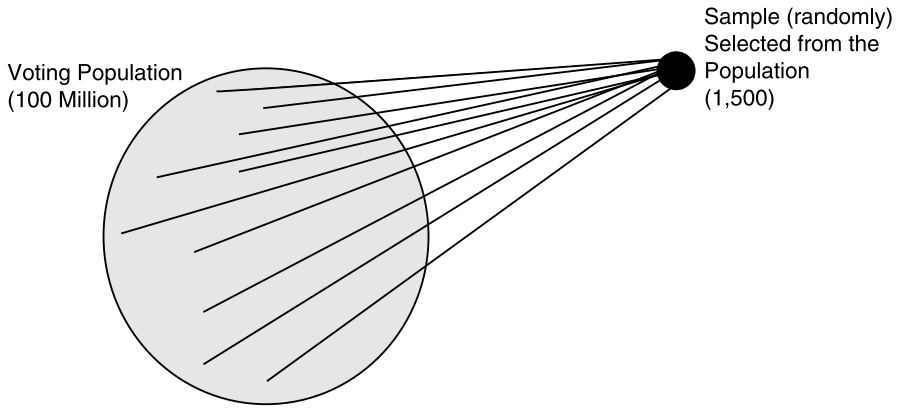


**Figure 8.1 A sample is selected from a population**

The move from sample to population is justified if we can be assured that the sample is *representative* of the population from which it is taken. Two factors are important in judging whether a particular sample is representative: its *size* and whether it was selected in an *unbiased* or *random* fashion.

Suppose that a young man has arrived at a Woody Allen view of life (that women will always reject him) on the basis of unsuccessful dates with only two women, and he uses this two-case sample to generalize to all women. The generalization that all women will reject him can be criticized by pointing out that the sample (two cases) is not sufficiently large to justify the inference to the whole population of all women he might date. This criticism should be used sparingly, however, because properly constituted samples need not be excessively large. A sample of 1,500 is often used by social scientists to support generalizations about the entire American population, and a sample of millions may be unrepresentative of the whole country if it is selected from a restricted geographical region or limited to a certain income group. For purposes of certain statistical tests, though, a sample of less than thirty is especially suspect because it may distort the findings.

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9. Typically, polling organizations hedge their bets by announcing a margin of error (with the usual Gallup poll, 1,000–1,500 people constitute the sample, and the margin of error is considered to be 3 percent). If we use a 3 percent error in our example, then in 95 percent of the cases, the actual percentage of the population is likely to be within 3 percent of the number listed: between 42 and 48 percent favoring candidate A (that is, 45 $\pm$ 3), 44–50 percent favoring candidate B (that is, 47 $\pm$ 3). The larger the sample, in general, the lower the margin of error. Statistical theory can be used to determine the interval in which we can have this confidence.

Ordinarily, there is a trade-off among three factors: (1) the *size* of the sample required, (2) the *margin of error* that is acceptable, and (3) *the level of confidence* that can be placed in the generalization. So, for example, if the pollster is prepared to live with a larger margin of error, she may use a smaller sample size. Indeed, if she were willing to say that candidate A is the choice of 45 percent plus or minus 20 percent, she could use a sample as small as thirty and still generalize to the American electorate.

Similarly, if the pollster (or the public) is willing to live with a confidence level lower than the customary 95 percent, she could get by with a smaller sample and retain the same margin of error. But the price here is a greater chance that the sample does not adequately represent the population. At the 95 percent confidence level, statistical theory tells us that the sample will accurately represent the population within the margin of error about 95 percent of the time (nineteen samples out of twenty). Sampling in the remaining 5 percent of the cases (one sample in twenty) will be inaccurate. If we drop the level to 90 percent, then we must be willing to accept a greater chance of error. We should expect to be accurate nine times out of ten, but that means being wrong in 10 percent of our polls.

**Trade-Offs**

1. Required size of sample
2. Level of confidence
3. Margin of error

There is no set formula for deciding among these trade-offs. How big a margin of error should we have? To know that 45 percent of the prospective voters prefer a candidate with a range of plus or minus 30 percent is not much help in predicting a close election. But we might be willing to live with a range of plus or minus 5 percent, or 4 percent in some circumstances. In others, we could demand even tighter boundaries, in which case we would need a larger sample. What level of confidence should we expect? Again, it depends on the reasoning involved. The level for a largely academic piece of research that is only looking for tendencies might be as low as 90 percent—that is, we might be willing to live with the likelihood of being wrong one time in ten. In medical research where a life might depend on our reasoning, we could demand a 99.9 percent level (incorrect findings of only 1 in 1,000).

Even if our sample is large enough, it still might not be representative. To be justified in going from data obtained about a sample to a conclusion about the larger population, the sample must resemble the population in terms of the characteristics measured. But a person doing sampling can't directly know whether

the sample is representative.[10] One way to improve the likelihood that it is representative is to select the sample on a random basis. Random sampling helps eliminate sources of systematic bias that over- or underestimate certain parts of the population and thereby helps ensure a sample with greater odds of being significantly like the population from which it was selected.

Drawing a random sample is not as easy as might initially be imagined. Picking numbers out of a telephone directory in what might seem to you to be a random pattern will not do (fatigue, for instance, might result in an underselection of people with numbers near the end of the book). A more respectable technique uses a computer or a table of random numbers to pick out the sample.[11] Other more elaborate methods of sampling have been developed to produce a sample that is as representative as possible in a number of different situations. One common variant is a stratified random sample, which tries to ensure that certain characteristics known to hold for the whole population, such as distribution of gender, age, or race, get replicated within the sample. If 20 percent of the population is between thirty and forty years old, then approximately 20 percent of the sample should also be between thirty and forty years old. Selection of individuals within each of the strata remains random. Of course, for such a procedure to work, we need to know the distribution of age or other stratifying characteristic in the population as a whole.

An argument based on a sample that is too small or that is selected in a biased way is open to criticism. But how do we know whether the size is adequate or the sample unbiased? The answer depends on background knowledge. A biologist might be prepared to generalize about some characteristics from a sample of one or two members of a newly discovered species to a conclusion about the whole species because she knows that some characteristics—number of chambers in the heart, for instance—vary little among members of the same species. Similarly, if a political scientist believes that attitudes about economic matters do not vary widely among Republicans, he may be able to determine Republican attitudes toward a new economic proposal from a smaller sample.

Conversely, a large sample may be needed if we seek information that is strongly influenced by narrow geographical or regional considerations. Whether there is much or little variation in a given characteristic is often a matter of expert

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10. Direct knowledge that a sample is representative would involve comparison of the sample with the population. But this would defeat the whole purpose of sampling. A sample is used because it is impossible or impractical to measure the whole population.

11. A table of random numbers can be used to generate telephone numbers. Such random digit dialing has an advantage over selection from a directory because unlisted numbers are polled. But such a method will still be somewhat biased—people without phones or people who spend large amounts of time away from home will not be adequately represented.

knowledge.[12] Sometimes our common everyday knowledge is sufficient to call a generalization into question because the generalization is based on too small a sample, as in the case of the young man who generalized from two dates to all women. Notice, however, that the size of the sample we demand depends on the nature of the case. Suppose that instead of basing a judgment about a person's prospects on dating two women, we were considering a judgment about his suitability for marriage on the basis of two unsuccessful marriages. Here, we might expect relatively little variation. Two failed marriages might indeed be good evidence that the person has difficulties in maintaining the sustained commitment required of a lasting marriage.

Background knowledge is also relevant to questions about the representativeness of a sample. If we have a complete listing of all the individuals in a population being examined, it is relatively easy to pick out a random or scientific sample using a table of random numbers, but such a complete list (sampling frame) is often unavailable. In its absence, we are forced to rely on our judgment about factors that might distort the results. Suppose we were sampling by randomly selecting telephone numbers out of a directory and conducting a phone interview. As we stated earlier, we would miss people without phones and those with unlisted numbers. We need additional knowledge to estimate how many people were left out of our sampling frame. The results of other surveys and telephone company figures would be helpful in determining how significant this number is. The importance of such background knowledge or speculation is even more conspicuous for stratified random sampling. If we are unsure about the racial makeup of a community, then a stratified sample that attempts to reflect a certain racial distribution will also be suspect.

Criticizing an argument by questioning the representativeness of the sample on which it is based might sometimes demand expert knowledge, but in other situations the nonexpert has background enough. Conclusions about community attitudes drawn exclusively from interviews at noon in the financial district or, alternatively, at 5:30 in a tavern near the docks are suspect even if the number of people interviewed is quite large. It is common knowledge that the people present at those times and in those places are not likely to be representative of the community as a whole. An argument that assumes they are is unsuccessful.

**Challenging the Truth of the Conclusion**[13] Even when we are not in a position to question the sample size or its representativeness, we may be able to undermine an argument that leads to a generalization by directly challenging

12. Given assumptions about this variability, statistical theory can give a precise answer to the question of how large the sample must be to produce a result with a given error factor.

13. Note that attacking the conclusion is appropriate only for inductive arguments. The ineffectiveness of doing so for deductive arguments was explained in chapter 4.

the generalization itself, irrespective of the argument offered on its behalf. The most effective way of doing so is to show that the alleged regularity described by the generalization does not exist. If someone propounds the universal generalization that in all marriages, the partner who makes the most money has the most decision-making power (perhaps citing the evidence of a few conspicuous cases), we can criticize the person by finding a *counterinstance*—that is, at least one individual who makes less money but has more decision-making power than his or her spouse. This criticism is most appropriate when the generalization in question makes strong assertions about *all* cases or *no* cases.

If a generalization does not make such a universal claim but is, rather, statistical in form—that is, it makes a claim about most (a few or a certain percentage of) cases, it may still be criticized, but a single (or even a few) counterinstances are not enough. What is needed is *counterevidence* in the form of a census (an examination of all) or an adequate sample of the population being generalized about. For example, if the generalization is put forward that *most* homeowners in Hot-tub Acres prefer a dog-leash ordinance, it can be criticized by pointing to a census of all homeowners that indicates that less than one quarter favor the dog-leash ordinance.[14] A similar counterargument could have been offered even if we didn't have a complete census, if our sample was sufficiently large and representative and we got similar results.

**Summary** In this section we have discussed the following types of criticism that are appropriate to arguments with generalizations as conclusions. Successful criticism depends in part on our background knowledge, but often the amateur knows enough to advance a compelling objection.

**Criticisms of Sampling Arguments**

1. ***Attacking the premises.*** Is the evidence cited in the premises true or can the data be disputed?
2. ***Questioning the representativeness of the sample.***
   a. ***Size of sample.*** Is the sample large enough (given the variability of the factors being generalized)?
   b. ***Sample selection.*** Is the sample characteristic of the population, or is it likely to be biased in such a way as to over- or underestimate some significant segment of the population? What was done to ensure representativeness? What are the potential biases that might affect the results? Are there alternative ways of selecting a sample that would make it more representative?

14. If the census indicated that, say, 53 percent favored the ordinance, then the counterevidence is less unequivocal. Is 53 percent most of the homeowners?

Note: Arguments that generalize on the basis of unrepresentative samples (particularly those that are too small or selected without appropriate randomization or appropriate sampling frames) are sometimes held guilty of the fallacy of *hasty generalization*.

3. ***Challenging the truth of the conclusion.*** Is the generalization presented in the conclusion made doubtful by counterinstances or counterevidence?

## Exercise 8.2 Criticizing Empirical Generalizations

1. The following passages describe situations in which a generalization is made on the basis of sample. For each case, (1) reconstruct the argument: The premise(s) will report an observation of a sample, and the conclusion will be a generalization about a larger population; (2) criticize any faulty reasoning exhibited in the passages; and (3) describe how a more appropriate sample might be obtained. As you reconstruct each argument, take care that the premises and the conclusion are statements about the same kind of object. For example, suppose a student newspaper carried out a survey about whether courses at the university included an exam. Most of the courses surveyed did. The newspaper concluded that most teachers give exams. If the premise in this particular-to-general argument is *Most of the courses surveyed included an exam,* then the conclusion should be written *Most courses include an exam* rather than *Most teachers give exams.* That is, the same "unit of analysis" should occur in the statement about the sample (the premise) and in the statement about the larger population (the conclusion). Indeed, it could be the case that most *courses* included exams, but that these courses were taught by a relatively small number of the junior faculty, whereas most faculty taught more advanced courses and offered research opportunities that used papers rather than exams.

   a. A student has taken three courses at the university. All her teachers were men. She assumes that most university teachers are men.
   b. A quality control engineer closely examines a random sample of automobiles produced on Tuesdays and Wednesdays at the Youngstown plant. He finds that only 3 percent of all the cars produced at this plant are faulty.
   c. In 1936 the *Literary Digest,* a popular magazine among the well-to-do and well educated, conducted a poll. The people surveyed were selected from among those included on their subscription records, in telephone books, and on automobile registration lists. They got responses from almost 2 million people and concluded that Franklin Roosevelt would not be elected.
   d. Bruce examined records of several countries and determined that in the United States, Canada, and France, males live considerably longer than females. He concluded that most males live longer than females.

e. The record book shows that the National Football Conference (NFC) in recent years has won more cross-conference games and the Super Bowl more often than the American Football Conference (AFC). The NFC will continue to dominate.

f. A student newspaper conducted a survey by asking students a series of questions. The survey was conducted at noon in front of the student center and involved 250 students out of a student body of 8,000. The interviewers were careful to get a sample with a racial, gender, and religious breakdown similar to that of the university as a whole. In the survey 53 percent of the students interviewed said they opposed abortion. The newspaper presented the results of its survey in an article that was headlined "Majority of Student Body Opposes Abortion."

g. A San Francisco area survey of randomly selected individuals seeking treatment for gout indicated that contrary to tradition, most gout sufferers are not addicts of rich gourmet food and beverages.

h. Al had trouble in high school math and didn't do a very good job in college algebra. He'll never make it as a math major.

i. All bachelors are unhappy. They just interviewed the guys down at the Beta fraternity house and they turned out to be unhappy. They got the same results down at Bernie's Tavern.

j.

**Study Links Alzheimer's to Childhood**[15]

Hardship during childhood may contribulte to Alzheimer's later, researchers say.

Early growth has far-reaching effects on many diseases, said study leader Victoria Moceri of the University of Washington in Seattle. Her team of researchers found that factors such as family size and location point to a role for childhood and teen-age living conditions in the risk of getting Alzheimer's.

In the study, published Tuesday in the journal *Neurology*, researchers carefully matched 393 Alzheimer's patients with 377 healthy people the same age. All the participants were over 60; the average age was 79.

Compared with those who grew up in rural or urban areas, people from the suburbs had 45 percent of the chance of developing Alzheimer's.

"Living outside the city in the suburbs in the 1920s was associated with a better standard of living."

15. Gannett News Service, "Study Links Alzheimer's to Childhood," *The Olympian (Wash.),* 26 January 2000, A8.

k.

**Sex Was Forced on Us 19 Percent Say in College Poll**[16]

Boston (AP)—A fifth of some 1,500 undergraduate women surveyed at Harvard said they had been forced into sexual activity they didn't want, according to a report published yesterday. Fifty-seven percent of the women polled also said they consider themselves sexually active, the *Boston Globe* reported. Nearly 1,500 women undergraduates, or 54 percent of the female undergraduate population, answered the questionnaire passed out in September 1983, the *Globe* reported. University Health Services and Radcliffe College sponsored the Women's Health and Sexuality Survey.

Nineteen percent of respondents answered yes to the question, "Have you ever been forced into any sexual activity you didn't want?"

That percentage was "frighteningly high," said the survey's author, Michelle J. Orza. "These are young women. How many will answer yes when they are 30?"

Seven percent of the respondents answered yes to the question, "Since you have been at Harvard, have you ever been the recipient of undue and/or unwanted personal attention from a faculty member, teaching fellow or administrative officer of the university?" the *Globe* said. Forty percent of women undergraduates answered yes to a similar question in a study last year, the Globe reported.

l.

**Poisonous Lead in Blood Declines**[17]

Boston (AP)—The amount of poisonous lead in people's blood fell dramatically during the late 1970s, probably because of declining use of leaded gasoline, a federal study concludes.

High levels of lead in the body are associated with learning problems and low intelligence, and some researchers fear that lesser amounts may also be dangerous.

16. Associated Press, *Seattle Post-Intelligencer*, 18 November 1984. Reprinted by permission.
17. Associated Press, *Seattle Post-Intelligencer*, 18 November 1984. Reprinted by permission.

The survey shows that average blood lead levels across the United States dropped about 37 percent between 1976 and 1980. The decline was so sharp that the researchers at first feared they had made a mistake.

Changes in the amount of two other possible sources of the substance—lead-based paint and lead tainted food—could not account for so great a drop, the researchers said. They concluded that "the most likely explanation for the fall in blood lead levels is a reduction in the lead content of gasoline during this period."

About 90 percent of all the lead in the air comes from gasoline, they noted.

m.

Working closely with the National Organization for Women, Dr. Stein designed a questionnaire and placed it in the September 1992 issue of Seventeen preceded the questionnaire by an article that told a disturbing story about a Minnesota girl named Katy Lyle who was tormented and humiliated on a daily basis by her peers and eventually took legal action. Certain passages from the story were highlighted in large boldface letters: "It's probably happened to you" and "You don't have to put up with it—in fact it's illegal. And your school is responsible for stopping it." The article ended with a word from Dr. Stein about the importance of creating more caring and just schools—"girls included." Then came the half-page tear-off questionnaire entitled "What's Happening to You?" Among the thirteen questions asked of the *Seventeen* readers were these:

- Did anyone do any of the following to you when you didn't want them to in the last school year?
  - (a) touch, pinch, or grab you
  - (b) lean over you or corner you
  - (c) give you sexual notes or pictures
  - (d) make suggestive or sexual gestures, looks, comments, or jokes
  - (e) pressure you to do something sexual
  - (f) force you to do something sexual
- If you've been sexually harassed at school, how did it make you feel?

Forty-two hundred of the magazine's 1.9 million subscribers returned the questionnaire, a 0.2 percent response. Nearly all the respondents reported they had been harassed as defined by the questionnaire. Specifically, the data showed that 89

percent of the respondents had received suggestive gestures, looks, comments, or jokes; 83 percent had been touched, pinched, or grabbed; 47 percent were leaned over or cornered; 28 percent received sexual notes or pictures; 27 percent were pressured to do something sexual; and 10 percent were forced to do something sexual.[18]

2. Design a sampling procedure that can serve as a basis for successful arguments leading to generalizations on the following topics. Indicate what techniques you are going to use to ensure representativeness. List some of the factors that might contribute to a bias in sampling. If possible indicate how to set up a sampling frame (a comprehensive list) from which to draw the sample.
   a. The number of minority-group members living in the United States.
   b. The attitude at your school toward drastic tax cuts.
   c. The attitude toward abortion in your neighborhood.
   d. The number of people in a class using this book who have used illegal drugs.
   e. The amount of air pollution in your city.
   f. The support in your community for eliminating smoking in all enclosed areas open to the public.

## A Special Case: Causal Generalization

Causal generalizations are of special interest because they often play a central role in a debate about what should be done. We want to know whether smoking, exposure to asbestos, or exposure to electromagnetic radiation *causes* cancer, not merely for the sake of the knowledge itself but also because knowledge of cause provides a basis for *control*. If we know that exposure to asbestos is the major cause of mesothelial cancer, then we can prevent or limit this cancer by intervening to control exposure to asbestos.[19]

18. Christina Hoff Sommers, *Who Stole Feminism: How Women Have Betrayed Women* (New York: Touchstone, 1995), 181–182. Copyright 1994 by Christina Sommers. Reprinted with permission.

19. Mesothelial cancer is a particularly rare form that attacks the lining of the lung, heart sac, and some tissues on the inside of the abdomen. A number of studies have indicated that a majority, and perhaps as many as 72 percent, of the victims have had substantial exposure to asbestos particles. Of even greater significance is the fact that about 10 percent of the workers in the asbestos insulating industry contracted the disease. See International Labour Office, *Asbestos: Health Risks and Their Prevention* (Geneva: International Labour Office, 1974), 6, 37.

Causal generalizations are typically justified by using sampling procedures. For example, a sample of individuals suffering from mesothelial cancer might be examined to determine whether they had had exposure to asbestos. If our sample is large enough and is representative of those having this form of cancer, then we might be justified in asserting that the rate of mesothelial cancer is higher in those exposed to asbestos. In such a case statisticians say that there is a statistically significant difference between the mesothelial cancer rate of those exposed to asbestos compared to those that do not have such exposure. When we make such a judgment we hold that a property observed in the sample (for example, difference in cancer rate among those exposed to asbestos) was found because the population actually has this property rather than as a result of some random factors (random error or "luck of the draw"). Samples are virtually never exact duplicates of the population—they don't represent it perfectly. But if our results are statistically significant we are justified in holding that the sample is likely to be a fairly good representative of the population, even though it is not likely to be perfect.

The branch of statistics that studies this topic is called *inferential statistics*. It examines under what conditions we are justified in going from judgments about the sample to conclusions (inferences) about the population from which it is drawn. As we indicated earlier, statisticians say that an inference is statistically significant when the probability of being wrong is .05 (1 in 20)—that is, 95 percent confidence—though in some medical research inferences are accepted only when the probability is .01 (1 in 100) or even .001 (1 in 1,000).

It is important to note, however, that statistical significance does not mean the results are significant in a broader sense. There could be a statistically significant difference between those who take an experimental drug and those who don't. But if this difference is very small, the drug might not be a very good choice as a medication. Similarly, a new reading program might produce statistically significantly higher reading scores compared to the standard method of teaching reading. But if this difference was between an average grade of 3.2 for the old method and 3.24 for the new one (on a 4-point scale), we would not say that this was an important enough difference to justify changing the policy on the reading curriculum, especially if this change cost a lot. Such small differences could be statistically significant (meaning that they are likely to exist in the population from which our experiment sampled) without being scientifically significant or policy significant. In general, *if the sample size is very large, even small differences will be statistically significant*. Whether they are significant in a wider context is not answered by statistics alone.

Furthermore, in the case of asbestos and mesothelial cancer, even if there is a difference that is both statistically significant and medically significant, we would not yet have established that asbestos causes cancer. This point is often made by saying that at best the process of statistical generalization establishes an

association or correlation (that is, that two or more features are characteristically found together), but that correlations do not necessarily indicate causes.[20]

The special problems about interpreting and criticizing causal arguments are illustrated by an argument once offered in a television interview by a critic of experimental education. This critic wished to discredit efforts to provide sex education in the public schools. She maintained that increases in the amount of sex education offered in the high school curriculum were strongly correlated with increases in the rate of sexually transmitted diseases (STDs).

She was correct in asserting that rates of STDs (at least of gonorrhea) have increased dramatically since 1960. But accurate information about the nature and extent of sex education programs in U.S. high schools is difficult to obtain and, unfortunately, she did not provide any sources. For purposes of illustration we can use a graph to display the actual increase in gonorrhea as estimated in the *U.S. Statistical Abstract*, along with some largely fictional data that will support the critic's claim about a strong correlation.[21]

The data that underlie this example do support the generalization that increases in the number of gonorrhea cases are correlated with increases in the number of students in high schools with sex education programs. This is shown visually by the roughly parallel lines in Figure 8.2 on the facing page.

Obviously, however, the critic was concerned to assert more than the mere correlation of sex education and gonorrhea. She is interested in showing that sex education courses are a major causal factor in the spread of STDs and that we can control the incidence of the disease by eliminating sex education from the schools. But such a jump from correlation to cause is at best suspect.

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20. Sometimes we are prepared to assert a causal generalization even without knowledge of a widespread correlation. You may believe that Frank's Finnish potato salad causes food poisoning from your own case, even before you determine that it affected other people as well. This indicates that the actual sequence of steps in discovering a causal relation need not always involve a move from correlation to cause.

21. An unpublished National Institute of Education study suggests that perhaps 36 percent of the schools offered sex education programs in the mid-1970s, according to Douglas Kirby and others, *An Analysis of U.S. Sex Education Programs and Evaluation Methods* (Bethesda, MD: Mathtech, Inc., 1979).

## Five Common Criticisms of Causal Reasoning

Five types of criticism are appropriate to simple causal arguments like the one just stated.[22]

1. The correlation may be coincidental. The two characteristics might be accidentally correlated rather than genuinely connected. Increase in the national

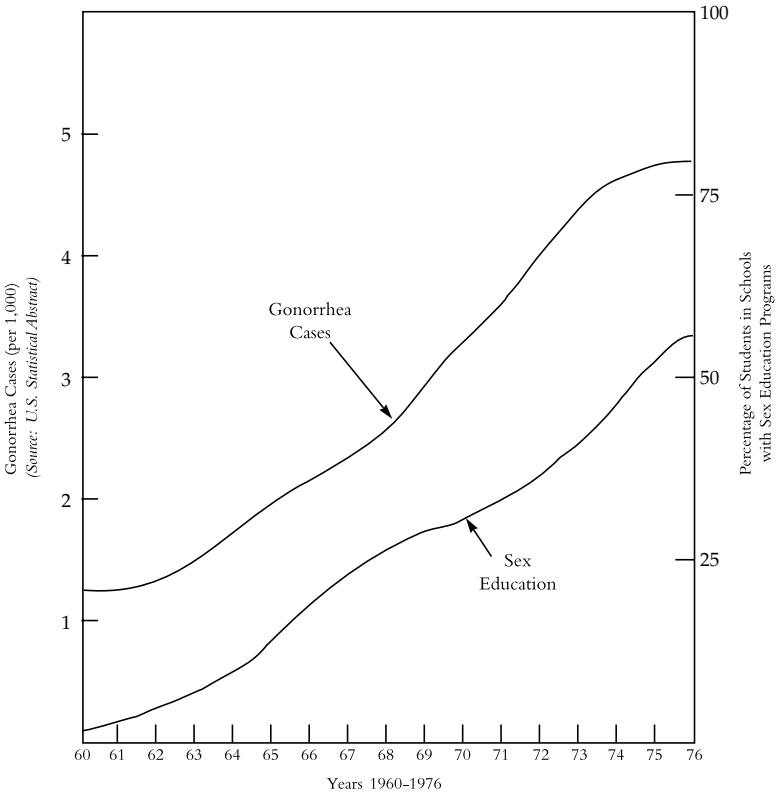


**Figure 8.1 Rate of gonorrhea cases per 1,000 population (actual estimates) and percentage of students (largely fictional estimates) in high schools with sex education programs**

22. These criticisms go beyond those considered in the previous section. We are not concerned here with the sampling procedures that established the generalization that asserts the correlation, although they might be faulty as well. Rather, we are dealing with the argument:

*(1) Increases in sex education courses are correlated with increases in gonorrhea (in the United States, 1960–1976).*

*(likely) Increases in sex education courses* caused *increases in gonorrhea (in the United States, 1960–1976).*

debt is also correlated with increases in gonorrhea but few are tempted to say that increases in the debt caused the increase in gonorrhea. The correlation between sex education and gonorrhea might be similarly coincidental.

2. The items might be correlated because they are *both effects of the same underlying cause*—that is, the apparent relation is *spurious*. Both the increase in gonorrhea and the increase in sex education courses might have been caused by changes in the sexual attitudes of the young. Increased sexual activity might have spread the disease and simultaneously moved school officials to develop sex education programs.

3. The causal relation might be genuine but *insignificant*. Sex education courses might have induced only a few people to engage in the sexual activity that led to the transmission of gonorrhea. In this case, sex education would be a causal factor, but it would not be a major causal factor in the sense that eliminating it would significantly control the spread of gonorrhea.

4. The causal relation might be in the *wrong direction*. Perhaps the increase in gonorrhea, and other factors, caused the increase in sex education courses by alarming parents and school officials, rather than the other way around. (Remember, to say that A is correlated with B implies that B is also correlated with A. So correlation does not tell us the direction of causation.)

5. The causal relation might be *complex*. An increase in sex education might have caused changes in sexual attitudes that led to increased sexual activity and, ultimately, to the spread of gonorrhea. But increases in gonorrhea might have simultaneously caused the development of expanded programs of sex education.

An argument that moves from correlation to cause is never adequate unless it is offered in a context that rules out these considerations.[23] What then are the requirements necessary to establish causation?

It is difficult to list the requirements in an enlightening definition of *cause.* Philosophers have long debated about what, if anything, is meant by saying that one thing causes another other than that they are correlated in certain ways. To determine whether something is a cause in the sense of a controlling factor, we characterize it as a *condition without which the effect would not have occurred*. Treated in this way, the connection between judgments of causation and questions of control is made more manifest. If an effect would not have occurred without the

23. When these factors are not taken into account, the move from correlation to cause can be deceptive. The author of the argument is sometimes said to be guilty of the fallacy of *post hoc, ergo propter hoc,* meaning "after this, therefore because of this."

cause, then, in principle, one way of controlling the effect is (or would have been) to eliminate the cause.[24]

In practice, of course, it might be impossible to control an effect even if we know the cause. We know that nuclear fusion causes radiation from the sun and other stars, but it is unlikely that we will be able to control, or prevent, solar radiation. Consequently, it is a mistake to think that merely establishing a cause permits us to control the effect in all or even most cases.

Our purpose in this section is to examine how causal generalizations may be justified and how arguments that support them may be criticized. By concentrating on causal arguments themselves rather than on any attempt to formally define causality, we can avoid many of the issues that have complicated the philosophical debate on this subject.

## The Controlled Experiment: Handling the X-Factor

It is helpful to see the task of establishing and criticizing causal generalizations as part of the dialogue process we discussed in chapter 7. The basic form of a causal argument displays a move from a statement of correlation or association to a statement of cause.

***Example 8.9***[25]

*(1) A is correlated with B.*

*(likely) A causes B.*

The "burden of responsibility to respond" shifts to one or another party in the dialogue[26]—proponent or critic of the causal generalization—depending on the background or context in which the generalization is advanced. The "bare argument" of the form displayed in Example 8.9 is open to the general criticism that

24. Although this characterization will serve the purpose of dealing with arguments from correlation to cause, it is inadequate as a general characterization of cause. It could be objected, for example, that smoke inhalation might cause a person's death even though the person would have died from the burns received anyway. So our rough characterization needs refinement. We might say that the death would not have occurred at the time it did without smoke inhalation.

25. More elaborate versions of this basic model refer to several studies that indicate the correlation:

*(1) A is correlated with B (in study 1).*
*(2) A is correlated with B (in study 2).*
*(3) And so on.*
*(likely) A causes B.*

26. Although the discussion is cast in terms of a dialogue between individuals, the same issues arise when an investigator has a "dialogue" with herself about causal generalization.

the correlation is coincidental. The burden is on the proponent of the causal conclusion to counter the claim that some other **confounding** factor, X (also associated with B), is in fact the major cause of B. The first task in constructing an adequate causal argument is to handle the X-factor, and an argument that doesn't is open to criticism.

The classical way of eliminating X-factors is by the *controlled experiment*. If properly carried out, such an experiment forms a background context that shifts the burden of responsibility from the proponent to the opponent or critic. Such experiments use random assignment procedures and close monitoring of possible interfering factors to blunt possible criticism. The virtue of the controlled experiment is that it transfers the onus of responsibility to the critic, who must now provide some reason (knowledge) why it is plausible that an X-factor is at work. Causal arguments that move from correlation to cause without any further support are weak, and the critic has the upper hand. But if the correlation is established by a controlled experiment, the critic must do more. It is not enough to suggest that there might be an X-factor; some attempt must be made to establish its existence.

To illustrate the controlled experiment, suppose we wish to establish that a new acne medicine (AcneX) taken in a certain dosage over a certain period of time causes a reduction in acne-related skin problems.[27] To do so, we randomly assign test subjects from some sampling list (say, adolescents) to one of two groups: the experimental group or the control group against which it is compared. The initial skin conditions of all the participants in both groups are determined. The experimental group is then treated with the new medicine in the required dosage, and the control group is not. If after the designated period of time the experimental group has fewer skin problems than the control group, we would be tempted to generalize the results by saying that the new acne medicine caused the reduction in acne-related skin problems. Our confidence in this causal generalization will be increased even more if the results can be duplicated in other studies.

The argument moves from a statement about association or correlation in a sample to a causal generalization as a conclusion.

***Example 8.10***

*(1)* Treatment with *AcneX is correlated with* reduced acne-related skin problems.

*(likely)* Treatment with *AcneX* causes reduction in acne-related skin problems.

27. Such a controlled experiment assumes that we can accurately measure the degree or amount of acne-related skin conditions, for example, the number of eruptions or percent of the body covered by irritations. A precise statement of what would count as such a condition is sometimes called an *operational definition*. We defined or specified operations such as counting the number of eruptions or measuring the irritated area.

The basic model for the controlled experiment as illustrated by this example can be depicted as follows:

***Example 8.11*** ***Controlled "True" Experiment (before-after design)***[28]

| | *Initial examination (pretest)* | *Experimental intervention* | *Outcome examination (posttest)* |
|---|---|---|---|
| *Experimental group (randomly assigned)* | *Condition of skin determined* | *Treatment with AcneX* | *Reduced acne-related skin conditions* |
| *Control or comparison group (randomly assigned)* | *Condition of skin determined* | *No treatment* | *No change in acne-related skin conditions* |

Random assignment strengthens the case for the causal generalization because it rules out a number of possible criticisms against it. These *threats to the causal claim* include the following:[29]

maturation

historical circumstance

moderation of extreme conditions

We know that acne tends to lessen as part of the normal human developmental process as people get older. *Maturation* could account for the experimental differences if the experimental group were significantly older than the comparison group. We know that people who volunteer to take an experimental drug are apt to be different from those who do not. The volunteers might be especially concerned with treating acne and as a consequence, they might be influenced by *historical circumstance* (advertisements or education programs) to take better care of their skin or might be willing to change their diet more readily than people in a comparison group who were not as eager to participate. In such a case, it is incidental advertisements and education, not the new drug, that account for the improvement in the skin of the experimental group. Finally, we know that if people are suffering from a particularly severe episode of acne it is likely that their condition will moderate even without special medication, given the ebb and flow

28. This is called a *before-after* design because it measures the experimental and control groups both before and after the intervention (in contrast to an *after-only* design that only examines the groups after the intervention).

29. Social scientists call them *threats to internal validity.* The concept of validity is used differently here than in discussing deductive arguments. A longer list can be developed but these three are important and illustrative.

of the disorder. If people were selected for the program (or self-selected) because of an especially severe episode, then we would expect a *moderation of extreme conditions* even if the test medication had no effect.[30]

Random assignment of individuals to the experimental and control groups makes it very unlikely that these threats to the causal claim apply. Of course, it is still possible that in spite of random assignment, those who are older, more eager, or suffering from an especially acute episode will be selected, by chance, for the experimental group and those without these conditions will fall into the comparison group. But this is also very unlikely. Unless the opponent has *specific reason* for believing that this is the case, the person's criticism amounts to little more than the weak assertion that it is *possible* that some X-factor exists. The burden of responsibility shifts to the critic to show some specific and significant differences between the experimental and control groups.

Even though random assignment handles certain threats, it does not handle all of them. It remains possible that expectations *bias* observation of results. Determining whether a particular patch of irritated skin is an acne-related skin disorder might not always be easy. Judgment calls need to be made, and even a conscientious investigator might be subtly biased if she expected reduction of acne in the experimental group and no reduction in the control group. To handle this possibility, *double-blind* experiments are conducted in which neither the person treated nor the judge of pre- and posttest results is aware of whether medicine has actually been given. To attain this state, a placebo (often a sugar pill) that looks like the real medication is given to those in the control group.[31] The use of a placebo is not possible in many "social experiments"—students in a new type of educational program typically know they are being "treated" though testers could be kept ignorant of whether they were.

Special problems arise in experiments with human subjects. The pretest might affect them in a way that influences the outcome. Measuring the acne in the control group might cause its members to take better care of their acne and thus lead to an underestimation of the effect of the new medicine. In some cases, it is possible to rule out this threat by having two more groups—another experimental and another control group that get only a posttest.[32] If these precautions are taken, the move from association or correlation to cause is even more strongly entrenched, and the task for the critic even more demanding.

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30. Social scientists call this *regression toward the mean*.

31. An even more elaborate extension of this design is the *double blind with crossover.* In this version, sometime during the experiment treatment is withheld from the experimental group and initiated for the control group. If the medicine works, the experimental group should improve and then return to the initial state; the control group should remain the same, and then improve.

32. This is sometimes called a *Solomon Four-Group Design*.

## What Happens If Control Is Limited?

The fully controlled experiment is difficult to carry out in many circumstances. Since acne is not life threatening and the medicine in question is not (we can assume) likely to have serious side effects, we can administer or withhold the medicine with few qualms. But consider the case of mesothelial cancer and asbestos cited earlier. Even if practical problems concerning the length of onset of the cancer could be handled by having a long-term experiment, further obstacles would remain. We could not morally or practically subject a sufficiently large random sample of people to asbestos exposure to determine whether they develop significantly more mesothelial cancer than a control group not so exposed. Rather, we have to rely on a so-called natural experiment. Nobody exposed people to asbestos to determine whether it had adverse health effects. But given that this exposure (the "intervention") actually occurred, we can investigate the health consequences. To do so it is necessary to compare the rate of mesothelial cancer among those exposed to those who have not been exposed.

***Example 8.12*** ***Design of a "Natural" Experiment***

| | *"Natural" intervention* | *Outcome examination* |
|---|---|---|
| *"Experimental" group: Asbestos insulation workers* | *Prolonged, heavy exposure to asbestos* | *10% incidence*[33] *of mesothelial cancer* |
| *Control group: People not exposed to asbestos* | *No exposure to asbestos insulation* | *0% incidence*[34] *of mesothelial cancer* |

Research into mesothelial cancer also differs from the acne case in that members of the experimental group are not randomly selected (though members of the control group might be). As a consequence, it is somewhat more likely that an X-factor exists that is systematically responsible for the outcome—perhaps some other material commonly found in the workplace.

33. International Labour Office, *Asbestos.*

34. The figure is virtually zero because mesothelial cancer is extremely rare. This is an unusual situation. A more common situation is that faced by researchers looking into smoking and lung cancer. Nonsmokers do get lung cancer, but at a much lower rate. The importance of cigarettes as a causal factor is indicated by this substantially higher incidence of lung cancer among heavy smokers. Further evidence is provided if we consider a second experimental group of moderate smokers. Their lung cancer rate is intermediate between that of the nonsmoker and the heavy smoker.

Even so, unless there is some other identifiable factor plausibly attributed to the experimental but not the comparison group, the response of the critic will be relatively weak.

The critic is in a stronger position when there is no random assignment to the experimental and control group.[35] Suppose there is a new method of producing reading improvement. Instead of the traditional classroom divided into poor, average, and good readers, a system is introduced for using interactive computer terminals for self-paced, individualized instruction. An appropriate evaluation of the success of this experimental alternative to the traditional method would employ an argument along these lines.

***Example 8.13***

*(1) Exposure to computer-assisted reading instruction is correlated with improvement in reading.*

---

*(likely) Computer-assisted reading instruction causes improvement in reading.*

Imagine that this inference is backed up by the following research design.

***Example 8.14*** ***Controlled Experiment Without Random Assignment***

| | *Initial examination (pretest)* | *Intervention* | *Outcome examination (posttest)* |
|---|---|---|---|
| *Experimental group: self-selected from available subjects* | *Reading score on a standardized test—measurement of other relevant factors* | *Computer-assisted instruction in reading* | *Reading score on an equivalent standardized test—measurement of other relevant factors* |
| *Control group: self-selected from available subjects* | *Reading score on a standardized test—measurement of other relevant factors* | *No special instruction—traditional methods* | *Reading score on an equivalent standardized test—measurement of other relevant factors* |

35. This design is sometimes called *quasi-experimental*. It provides more support than a *non*experimental design that merely compares outcome scores and in which the experimental group might have begun with higher scores. It is not as resistant to criticism as the "true" experiment with random assignment.

Given that the experimental group was self-selected and given our knowledge about possible factors associated with willingness to participate, the burden of responsibility shifts to the proponent of the causal generalization who has to rule out the possibility that change is really the result of some other factor, such as intelligence or parental involvement. If further information is available to rule out these factors, the burden shifts back to the critic to produce some additional reasons for rejecting the inference. The more knowledge we have about the case, the better position we are in to confidently accept or reject the inference. The advantage of a fully controlled ("true") experiment is that it allows us to get by without much specific, additional knowledge about the experimental and control groups.

Even if we can be confident, however, that the intervention is causally related to the outcome in a particular case, we may not be able to generalize as broadly as we would like. A particular drug rehabilitation program that worked for clients in Des Moines, Iowa, might not work for clients in New York City. To generalize to broader contexts, it is necessary not only to have random assignment to experimental and control groups, but also random selection from the population to which we want to generalize.[36]

For instance, the program might work not because of its nontraditional structure, but because of the special characteristics of the administering staff. Thus, although a controlled experiment might show that the program had a causal impact in curbing continued drug abuse among those randomly assigned to it, we aren't justified in concluding that programs with that nontraditional structure cause rehabilitation by virtue of their structure. Similarly, in Example 8.13, any claims that the intervention of computer-assisted instruction is the sole cause of the change depends on background assumptions. It is presupposed, for example, that any improvement results solely from computer-assisted instruction without regard to unknown factors. If it produces results only when some other unexpected factor is operating, then clearly we would be mistaken in predicting that it will work in the future, for this unknown factor might no longer be present. For instance, computer-assisted instruction using a TV screen as a terminal might work only in a culture in which there is a great deal of recreational TV watching as well. As long as the control and the experimental groups are both drawn from a population that has had massive exposure to TV, we are apt to miss this connection. Of course, the greater our understanding of the factors affecting learning—that is, the better our theories—the better we will be able to determine whether the control and experimental groups are alike in relevant respects. Only by having an adequate theory can we minimize the possibility that there is some X-factor affecting our results.

There is a second way that a theory is assumed when causal inferences are made. The outcome or effect must be measured, and this measurement often relies on a theory that justifies the measuring "instrument." It is assumed in the

36. If you select from an appropriate population, then your results are said to have "external" validity.

computer-assisted instruction example, for instance, that the standardized reading test is a good measure of reading ability. Such background assumptions about "instruments" or techniques of measurement are commonplace in the natural sciences, as for example when a spectrophotometer—an instrument for measuring the wavelength of emitted light—is routinely used in the course of some laboratory experiment. Unless there is a reason for believing the apparatus is broken, the scientist assumes that the spectrophotometer is accurately measuring wavelength.

These assumptions about the measuring instrument depend on appeal to a theory concerning its operation that is often well known and well accepted. And generalizations that rely on experiments employing such instruments presuppose the adequacy of these underlying theories. When doubt can be raised about measuring "instruments" such as a survey research questionnaire or an IQ test, it may be difficult to justify a generalization based on their use.[37]

Chapter 9 contains a detailed discussion of empirical theories of the type that are often assumed by causal inferences. Unless a causal generalization is backed up by appropriate controlled experiments and acceptable theories about relevant factors and instruments, it remains open to question. An argument that blithely moves from correlation to cause may always be criticized. The most impressive criticism will at least sketch out how the correlation could be obtained even though there is no causal relationship.

In review, there are five ways in which such criticism may be launched without considering more extensive issues about theory.

**Five Criticisms of Arguments from Correlation to Cause**

1. ***Coincidental correlation.*** Some unsuspected factor is shown to be the genuine cause, and the correlation is thereby shown to be purely accidental.
2. ***Joint effect of an underlying cause.*** Some underlying factor is shown to be directly or indirectly responsible for the items correlated. That is, the apparent relation is spurious.
3. ***Genuine but insignificant cause.*** Other factors are shown to be of greater importance in producing the effect in question.
4. ***Wrong direction.*** The correlation is shown to support a causal inference in which cause and effect are the opposite of what has been claimed.
5. ***Causal complexity.*** It is shown that factors correlated are not related to each other in a straightforward way. Other factors might be involved and several criticisms might apply at once.

37. Further, even if we establish that some intervention actually causes some change in a population, as noted earlier, we have not yet established whether the amount of change is significant. Suppose, for instance, that the acne medicine we described earlier reduced skin problems, on average, one-quarter of a skin eruption per person per month. Is that significant enough to take the medicine? Probably not.

## Exercise 8.3 The Faulty Move from Correlation to Cause

Indicate whether these passages contain a faulty move from correlation to cause. If so, state your criticism.

1. There is a correlation between heavy consumption of coffee and heart attacks. So coffee drinking causes heart attacks.
2. There is a correlation between the increase in the number of sex education courses during the 1960s and the increase in the sexually transmitted disease rate, so sex education was an important factor in the increase in the sexually transmitted disease rate.
3. There is a significant correlation between going to the hospital and dying, so hospitals are important causal factors in the occurrence of deaths.
4. There is a significant correlation between the increase in the number of hours children watch TV and a decrease in the college admission test scores, so TV watching caused the lower scores.
5. There is correlation between smoking and lung cancer, so smoking causes lung cancer.
6. A survey by the Sleep Disorder Clinic of the VA Hospital in La Jolla, California, (involving more than 1 million people) revealed that people who sleep more than ten hours a night have a death rate 80 percent higher than those who sleep only seven or eight hours. Men who sleep less than four hours a night have a death rate 180 percent higher, and women with less sleep have a rate 40 percent higher. This might be taken as indicating that too much and too little sleep cause death.
7. 

**Study Link Homicide with TV Use**[38]

Seattle(AP)—Television viewing "is a factor" in about half of the 20,000 homicides and many other violent crimes that occur each year in the United States, according to a psychiatrist who studied statistical links between homicides and the rise in television ownership.

The study, published Tuesday in the April issue of the *American Journal of Epidemiology,* is billed by the University of Washington as the first study ever to look at the statistical relationships between exposure to television and acts of violence for the entire country.

38. Associated Press, *Daily Olympian (Wash.),* 5 April 1989. Reprinted with permission.

The study by Dr. Brandon Centerwall, a member of the psychiatry faculty at the University of Washington School of Medicine, also indicates that as many as half of other violent crimes—including rapes and assaults—are related to exposure to television.

"Television is a factor in approximately 10,000 homicides each year in the United States," Centerwall told a news conference Tuesday.

"While television clearly is not the sole cause of violence in our society, and there are many other contributing factors, hypothetically if television did not exist there would be 10,000 fewer homicides a year."

To arrive at this conclusion, Centerwall studied the white population of South Africa, where television was not introduced until 1975. Using statistics from 1945 to 1974, he compared homicide rates among South African whites to the rates among U.S. whites and the entire Canadian population.

He found that homicides remained roughly flat in South Africa before television was introduced. In the United States and Canada, however, homicide rates doubled within 20 years after the widespread introduction of television, Centerwall said.

It took Centerwall seven years to complete his study.

Centerwall said he hypothesized that if television ownership is followed by an increase in violence, then those populations that had television earlier should have had an earlier increase in violence.

He tested his theory by comparing the change in homicide rates among white and minority populations in the United States. According to Centerwall, televisions were widespread in American white households about five years before they appeared in minority homes. Accordingly, homicide rates among minorities rose four years after the rates went up among whites, he said.

Centerwall said regions of the United States that had widespread television before the rest of the country also saw earlier increases in homicide rates.

"There is a strong relationship between when a region acquired television and when its homicide rates went up," he said.

According to Centerwall, the homicide rates among South African whites in 1983—the last year for which statistics were available—were 56 percent higher than in 1974—the year before the introduction of television, indicating a trend similar to what occurred in the United States after the introduction of television.

In addition to the fact that South Africa did not introduce

television until as late as the mid-1970s, it was an appropriate country to choose for the study because it is a prosperous, industrialized Western country similar in many respects to the United States, Centerwall said. He limited his study to South African whites because South African blacks and other minorities live under very different conditions.

Centerwall said he found there was a lag of 10 to 15 years between the time television was introduced in the United States and the rapid increase in homicide rates. He explained that other studies have determined that children are most likely to be strongly influenced by television. Homicide, however, is generally an adult crime, so the initial "television generation" would have had to age 10 to 15 years before it would have been old enough to affect the homicide rate, he said.

8.

**Ear Hair Linked to Heart Attacks**[39]

Boston (UPI)—Dark hair in and around the hole leading into a person's inner ear indicates they may be at greater risk of having a heart attack, a Boston University doctor said yesterday.

A study of 43 men and 20 women found that those people with ear hair often had heart attacks. The findings were published as a letter to the editor in the *New England Journal of Medicine.*

People with a crease running across their ear lobe, it had been shown in earlier studies, also may be more likely to have heart attacks. The latest study found 90 percent of all people studied with both traits have had a heart attack.

**(Hint: What might the "X-factor" be?)**

39. United Press International, *Seattle Post-Intelligencer,* 14 November 1984. Reprinted with permission.

9.

**Type A's Must Change to Avoid Heart Attacks** [40]

Miami Beach, Fla.—Teaching heart attack victims to conquer their hostility and impatience, hallmarks of Type A personality behavior, cuts their risk of suffering another seizure by half, a researcher has reported.

"I think that when this is confirmed, it will almost be considered malpractice not to try to alter Type A behavior in the patient who has already had a coronary," said Dr. Meyer Friedman, of Mount Zion Hospital and Medical Center in San Francisco. He released his findings at a meeting of the American Heart Association.

People with Type A behavior tend to approach life with a sense of urgency. They are impatient, aggressive and often hostile.

About three-quarters of all Americans are said to show some degree of Type A behavior. However, the link between this kind of personality and heart disease is still controversial.

In the latest study, doctors randomly assigned 891 heart attack survivors to two groups. Some received ordinary cardiac care, while the rest also were counseled by psychiatrists in an effort to change their behavior.

After three years, 9 percent of those who stuck with the counseling program had suffered new heart attacks, compared with 20 percent of the people who had received medical care alone. And of those who dropped out of the behavior training, 26 percent had heart attacks.

"What a person feels and thinks may be as important as what he eats or inhales in respect to heart disease," Friedman said.

40. Associated Press, *Seattle Post-Intelligencer,* 18 November 1984. Reprinted with permission.

10.

**Why Sex Education Is Like Snake Oil**[41]

by Lawrence Shornack

To the Editor:

Walter A. Sheldon (letter, Oct. 4) criticizes abortion opponents for hypocrisy in not also advocating sex education, which would reduce teenage pregnancies.

While most research fails to find that information results in contraceptive use, sex educators continue to sell the public on the notion that the problem lies in lack of information.

Although parents endorse factual sex education in polls, sex educators deride facts as "plumbing," and textbooks promote sexual permissiveness beyond traditional values.

When contraceptive use increases but pregnancies continue to climb, researchers explain that teens are using the wrong contraceptives.

When research repeatedly shows that sex education does not have the desired effect, sex educators simply change the packaging; the latest version, called "sexual decision-making," somehow is to prepare girls in

11.

**Sex Education Is Not Like Snake Oil**[42]

by Jo Ann S. Putnam-Scholes

To the Editor:

Lawrence Shornack (letter, Oct. 14) speaks with a forked tongue when he compares sex education to snake oil, saying research indicates no benefits from such programs. Research can argue both sides, but United States Census figures are more telling. Births to teens 14–19 peaked in 1957 and today are down by over 45 percent.

This sharp, steady decline paralleled the advent of the Pill in 1960, and the doubling of birth control clinics nationwide during that decade. More importantly, this reduction in births to teens began 13 years before abortion was legalized. Conclusion: access to effective birth control significantly reduces births to teens. Teens are prompted to sexual activity by textbooks! To test this, the 1950's are a good control group, for teens then had little if any sex education textbooks or courses, the Pill was not available, and teens knew the strict code prohibiting their sexual activity. Yet their very high rate of births

41. Lawrence Shornack, *New York Times*, 14 October 1984. Copyright © 1984 by The New York Times Company. Reprinted by permission. Lawrence Shornack is associate professor of sociology at North Carolina Agricultural and Technical State University.

42. Jo Ann S. Putnam-Scholes, *New York Times*, 11 November 1984. Copyright © 1984 by The New York Times Company. Reprinted by permission. Jo Ann S. Putnam-Scholes has taught sex education in public high schools for 25 years.

grade school for the sexual rush they will encounter in adolescence.

Hypocrisy is not the best word to describe refusing to recommend snake oil to the public.

dispels the myth that those restrictive conditions of the 50's promoted sexual decorum. Nostalgia prevents us from learning from the past.

While it may be difficult for the public to resist the unfounded sociological smorgasbord (permissive parents, society, textbooks, and the standbys: sex, drugs and rock'n' roll) offered to account for so-called teen sexual irresponsibility today, as a trained sociologist, Mr. Shornack ought to resist such tempting oversimplifications.

Widespread access to modern contraceptives is barely 25 years old, a brief time indeed to expect profound changes in so complex a realm as sexual behavior. We don't expect children to master math or history with a single-course exposure at age 13 or 15; why are we disappointed and angry if they fail to master sexual responsibility in so short a time?

But change does occur with long-term, sequential education, and when schools at every grade-level help youngsters develop self-esteem, individual responsibility, and respect for personal, family, and societal goals. And if that's snake oil, I'll take a dozen bottles, please.

## Arguments with Statistical Premises

The second major type of inductive argument we introduced in this chapter moves from general to particular, and in some forms is called a "statistical syllogism." As we stated earlier, this type contains "statistical" premises (those with *most*, *many*, *few*, a certain percentage of cases, rather than *all* or *none*). Unfortunately, no one has produced a theory that does for them what the theory of validity does for deductive arguments. No limited set of rules or techniques allows us to demarcate, in a foolproof way, good and bad patterns of reasoning for these cases. The basis for this difficulty lies at the very foundation of empirical reasoning. Our judgments about them rely on our background knowledge in a crucial way.

**Criticism of Arguments with Statistical Premises** Three criticisms apply to arguments with statistical premises: calling premises into doubt, indicating that a sequence of premises dilutes the likelihood of the conclusion, and showing that the argument does not use all the available relevant evidence. The first two are only occasionally applicable, the third is more widely useful. First, as in the case of deductive arguments and inductive arguments that move from the particular to the general, you can simply call one or more of the premises into doubt. Second, even when all the premises are true, arguments with statistical premises can sometimes be dismissed without recourse to background knowledge, as when the conclusion is just not made more likely by the premises. The likelihood of the conclusion can be "diluted" by having an excessive number of premises each of which is only somewhat likely. Each step in the argument lessens the likelihood of the conclusion. Opportunity to criticize such structurally faulty arguments is likely to arise, however, only when the arguments are complex.

***Example 8.15***

*(1) Many air traffic controllers are under great stress.*

*(2) Many people under stress are heavy drinkers.*

*(3) Many heavy drinkers lose their driver's licenses.*

*(4) Many people who lose their license are bad insurance risks.*

*(5) Many people who are bad insurance risks live in New York City.*

*(6) Fran is an air traffic controller.*

---

*(likely) Fran lives in New York City.*

This string of premises does not make the conclusion more likely, and the longer the series of such connections, the more questionable the inference.

## Meeting the Requirement of Total Available Relevant Evidence

A successful inductive argument must meet the "Requirement of Total Available Relevant Evidence." The principal method of criticizing arguments with statistical premises is showing that it does not do so. The requirement can best be put in focus by noting that two inductive arguments of this type can have all their premises true and yet yield incompatible conclusions.

***Example 8.16***

**(A)**

*(1) Most people who have their gallbladder removed recover without serious complications.*
*(2) Didi is about to have her gallbladder removed.*

*(likely) Didi will recover without serious complications.*

**(B)**

*(1) Most 103-year-old persons who have major surgery suffer serious complications.*
*(2) Didi is a 103-year-old person about to have major surgery for gallbladder removal.*

*(likely) Didi will suffer serious complications.*

Background knowledge is important in this case. If all we know about Didi is that she is about to have her gallbladder removed, then argument A seems successful (given the truth of both premises); however, given the additional knowledge that she is 103 years old, we can produce a counterargument B that leads to the incompatible conclusion that Didi will suffer serious complications.[43] This counterargument provides more specific information that points out that the case is an exception to a statistical premise. Given our common knowledge about surgery for the elderly, Didi's age makes her a plausible exception to the premise that most people who have their gallbladder removed recover without serious complications.

Similar considerations apply to some arguments that present "shocking statistics." Somebody says to Mike, "Do you realize that a murder is committed every 31 minutes? So be careful, you are in danger of being murdered."[44] Given appropriate knowledge of Mike's circumstances, we can produce a counterargument.

43. This situation has no analogue in the case of deductive arguments. Two deductively sound arguments cannot come to incompatible conclusions. In this case, we have arguments with true premises in which the conclusion of each is likely relative to the premises, but that have incompatible conclusions.
44. Murder rate based on the FBI's figure of 16,914 murders nationwide in 1998 from *Crime in the United States: Uniform Crime Reports 1998,* 17 October 1999.

***Example 8.17***

| **Argument Criticized** | **Counterargument** |
|---|---|
| *(1) A murder is committed in the United States every 31 minutes (that is, murder is frequent in the United States).* | *(1) A murder has never been committed in Serenityville.* |
| *(2) Mike lives in the United States.* | *(2) Mike lives in Serenityville.* |
| *(likely) Mike is in danger of being murdered.* | *(likely) Mike is in little danger of being murdered.* |

Here again the counterargument introduces more specific information that suggests that a premise in the argument being criticized does not directly apply.

Similar consideration apply to arguments case in more "statistical form."[45] For example,

***Example 8.18***

| **Argument Criticized** | **Counterargument** |
|---|---|
| *(1) 60% of college graduates get a high-paying job after graduation.* | *(1) 75% of college binge drinkers do not get a high-paying job after graduation.* |
| *(2) Sybil is graduating.* | *(2) Sybil is a college binge drinker.* |
| *(60% likely) Sybil will get a high-paying job after graduation.* | *(75% likely) Sybil will not get a high-paying job after graduation.* |

The counterargument here succeeds because it leads to a more likely conclusion.

Our commonsense background knowledge sometimes provides us with the appropriate materials needed to construct a counterargument, but in other cases arguments can be challenged (if at all) only on the basis of expert knowledge. Consider the following argument.

45. The "statistical syllogism" comes in several forms. The most "general" is

| | | |
|---|---|---|
| *(1) Most $P_1$'s are $P_2$'s.* | | *(1) Most □ are △* |
| *(2) m is a $P_1$.* | | *(2) m is a □* |
| *(likely) m is a $P_2$.* | Or more formally | *(likely) m is a △* |

But we can be more specific about how likely the conclusion might be

| | | |
|---|---|---|
| *(1) N% $P_1$'s are $P_2$'s.* | | *(1) N% □ are △* |
| *(2) m is a $P_1$.* | | *(2) m is a □* |
| *(N% likely) m is a $P_2$.* | Or more formally | *(N% likely) m is a △* |

***Example 8.19***

*(1) Most long-time, heavy smokers suffer from smoking-related health problems.*

*(2) Bruce is a long-time, heavy smoker.*

*(likely) Bruce will suffer from smoking-related health problems.*

Given the results of numerous scientific studies that have been cited by the Surgeon General of the United States, such an argument might seem conclusive (assuming that the premise about Bruce is true). But perhaps Bruce has a rare genetic makeup that enables his body to resist the health-destroying effects of heavy cigarette smoking. Should this be the case, a sophisticated scientist supported by the Tobacco Institute might be about to launch a counterargument along the following lines:

***Example 8.20***

*(1) Most people with the "lucky" gene configuration will resist the health-sapping consequences of smoking.*

*(2) Bruce has the "lucky" gene configuration.*

*(likely) Bruce will resist the health-sapping consequences of smoking.*

The important point here is that the criticism of arguments with statistical premises may depend on expert knowledge. The mere possibility that an expert might ultimately discover some new, relevant information is not in itself a reason for rejecting an argument that is otherwise acceptable. In a sense these arguments are always open to question because additional evidence can always be made available *in principle*. But we can strengthen an argument that has statistical premises by using all available, relevant evidence. If we don't have the time or energy to marshal *all* available evidence, we can still bring the conclusion within an acceptable margin of error. We can do this more readily if we believe that additional evidence is only minimally important and that additional factors are unlikely to appear. If an argument does not live up to the requirement of using *all available, relevant evidence*, it is open to criticism.

In this section we considered three criticisms appropriate to arguments with statistical premises:

**Criticisms of Arguments with Statistical Premises (general-to-particular argument)**

1. Premises are doubtful
2. Long series of premises can dilute the strength of the conclusion
3. Total available evidence not used as shown by a counterargument

## Exercise 8.4 Criticizing Arguments with Statistical Premises

Which of the following arguments are acceptable? Sketch out your criticisms of those that are not. Use information provided in the premises, or alternatively, make use of your own background knowledge to develop any appropriate counterarguments.

1. *(1) Most auto fatalities are the result of the driver drinking.*
   *(2) Armand was in an auto fatality at 9:30 on Sunday morning.*

   *(likely) Armand's death was the result of the driver drinking.*

2. *(1) Most sexually active women who take birth control pills according to directions do not conceive.*
   *(2) Edna is a sexually active woman who takes birth control pills according to directions.*

   *(likely) Edna will not conceive.*

3. *(1) Most areas with low unemployment rates have higher wages.*
   *(2) American cities with a strong service economy have low unemployment.*

   *(likely) American cities with a strong service economy have higher wages.*

4. *(1) Most incumbents are reelected in the United States if they decide to run.*
   *(2) Mayor Armwrestler is an incumbent running for reelection who has long stood for increasing expenditures on social programs.*

   *(likely) Mayor Armwrestler will be reelected.*

5. *(1) Most students will benefit materially from a college education.*
   *(2) Sandy is a college student studying Greek and Latin.*

   *(likely) Sandy will benefit materially from a college education.*

## Another Special Case: Arguments from Analogy

There is a common kind of argument, called an *argument from analogy*, that rests on a comparison of two things. For example, it has been argued that the universe is like a clock. Both, it is claimed, are systems of moving parts, set in a precise order, balanced, and having repeated, uniform motion. The argument concludes that since clocks have makers, it is likely that the universe had a maker.

Arguments like this are not deductive, since being similar in some respects does not guarantee that things will be similar in other respects. At most, the premises make the conclusion *likely*. Of the two kinds of nondeductive arguments we have discussed, arguments from analogy are more like those that move from a generalization to a particular instance. Typically, an argument from analogy claims that two kinds of things are alike in many respects (this is the general premise), and that the first has some further characteristic. It then moves to the claim that the second thing shares this characteristic (this is the particular conclusion).

How can an argument from analogy be criticized? Let's begin with a simple example. A U.S. vice president once claimed that he never expressed disagreement with the president's policies because "You don't tackle your own quarterback." His argument rested on an analogy between presidential administrations and football teams, in which the role of the president is parallel to that of quarterback. As with many arguments from analogy, it is left to the audience to think of other ways these two kinds of organizations are similar. We might note, for example, that both "teams" include members who perform specialized tasks and whose actions must be coordinated; and that both teams are often required to respond to situations quickly and decisively. We might incorporate such considerations into an argument along the following lines:

***Example 8.21***

*(1) Organizations like presidential administrations and football teams have common characteristics a, b, c. . . .*

*(2) A football team has the additional characteristic that it functions best if the leader is obeyed uncritically.*

*(likely) A presidential administration functions best if the leader is obeyed uncritically.*

Generally, arguments from analogy have this form:

***Example 8.22***

*(1) Things like A and B have characteristics a, b, c. . . .*

*(2) A has the additional characteristic z.*

*(likely) B has characteristic z.*

Note, however, that it is not the number of characteristics the two things have in common that will strengthen an argument from analogy. A stuffed animal and a real animal can have countless trivial similarities—color, shape, size, number and proportion of limbs, and so on. But these similarities don't make it more likely that since the real animal has a brain, the stuffed animal has a brain also. There must be a genuine connection between the shared characteristics and the additional characteristic in question.[46]

We must keep a similar point in mind when we criticize an argument from analogy. It might seem that we can criticize this kind of argument by simply pointing out a large number of ways in which the two objects in question are *not similar*. The problem, however, is that some dissimilarities are relevant but others are not. In attacking the analogy between the presidential administration and a football team, it is surely irrelevant to point out that there are more people in a presidential administration than there are members of a football team. But it *is* relevant to point out that there is no close similarity between winning a football game and some function or purpose of a presidential administration. What makes the latter a relevant criticism but not the former?

Basically a dissimilarity is relevant if it makes *less likely* the particular similarity asserted in the conclusion of the argument. The fact that a football team has fewer members than the administration doesn't make it less likely that the quarterback and the president should both be uncritically obeyed. But the fact that the administration aims (or *should* aim) at making wise policy decisions rather than winning contests is relevant. Whereas tackling the quarterback is obviously detrimental (normally) to winning football games, criticizing the president might actually play a helpful role in arriving at wise policy decisions.

Such considerations lead to a counterargument to the argument from analogy in Example 8.21.

***Example 8.23***

*(1) Most activities that aim at making wise policy decisions demand critical consultation.*

*(2) A presidential administration aims at making wise policy decisions.*

---

*(likely) A presidential administration demands critical consultation.*

46. The nature of this connection is a complicated matter to explore thoroughly. In biology, for example, where analogies are drawn between one biological system and another, certain important characteristics are seen as serving a necessary function in the preservation of the whole. These characteristics can be seen as genuinely connected in our special sense in that they cannot be eliminated without substantially affecting each other. For instance, food intake and locomotion are connected in this way. Roughly speaking, if two systems are of the same type, then any characteristics that serve a necessary function in one will have an equivalent in the other. The football analogy treats both the football team and the presidential administration as instances of a certain kind of system and holds that uncritical obedience to the person serving the leadership function is essential to maintaining the strength and effectiveness of the group.

Another approach to criticizing an argument from analogy is to *challenge the premises*. As we have construed such arguments, the premises are of two kinds: one cites similarities between objects; the other attributes a certain additional characteristic to one of the objects. To challenge the first kind of premise, you can simply raise the question of whether the supposed similarities really hold.[47] Concerning the "universe-as-clock" analogy, you might ask whether the universe really has the kind of precise order and uniform motion that a clock has, or whether it is not in fact much more chaotic.

The second kind of premise, which attributes an additional characteristic to one of the objects (as in "You don't tackle your own quarterback"), might also be subject to doubt. Tackling your own quarterback is just the thing to do if the quarterback is running in the wrong direction. In such a criticism, we *accept the basic analogy but maintain that it needs to be extended in another way.* We point out that if the analogy is developed properly, we can justify criticizing the president in certain extreme circumstances. Such criticism not only takes support away from the conclusion of the argument, it can actually make the conclusion unlikely. For if the analogy between the two objects holds, and if it is sometimes justified to tackle your own quarterback, then it is probably justified also for a vice president to criticize the president. This would be the case if the president were working against the proper goals of the administration.

Criticizing a sophisticated analogy may take some ingenuity, particularly when you attempt to point out a relevant dissimilarity between the objects that have been compared. We have not attempted to point out, in the "universe-as-clock" analogy, any relevant dissimilarities that would make it less likely that the universe had a maker. We leave this as a problem in Exercise 8.5 to test your ingenuity.

Finally, analogies can be usefully employed in the reasoning process even when analogical arguments based on them are open to criticism. Through most of the book, we have concentrated on reconstruction and criticism. We have said little about creating arguments or, more generally, coming up with new and interesting ideas. It is in the discovery or creating phase of reasoning that analogies might be most important. Often we can get insight into new domains by seeing them as analogous to more familiar territory. We might, for instance, get insight into special features of human memory by seeing it as analogous to computer memory, which at least the computer scientist understands well. But this insight might only be a starting point. Even if the analogical argument in itself is unconvincing, the analogy might suggest a new hypothesis or theory about human memory. This hypothesis might not be defensible by appeal to the analogy alone but could be *independently tested* by carefully studying human memory. Because analogies can play this role in creative thinking, the best analogies are often held to be those that are *most fruitful* in generating new, interesting, and unexpected connections.

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47. Arguments that depend on appropriate similarities that don't hold are sometimes treated as falling prey to the *fallacy of faulty analogy.*

**Ways of Criticizing Analogies**

1. Point out dissimilarities that lead to a counterargument.
2. Challenge the premises:
   a. Question whether the similarities hold.
   b. Extend the premise in a different way.

## Exercise 8.5 Criticizing Arguments from Analogy

Criticize the following arguments from analogy.

1. A country is like a ship with the president as captain. Just as a captain should be obeyed without question during a storm, the president should be given special powers in periods of crisis.
2. In the politics of confrontation the rules of poker apply. Once you begin to run a bluff, never show the slightest hesitation.
3. The finances of a government are like the finances of a family. A family can't go on spending more than it takes in.
4. In life as in basketball you cheat if you can get away with it—that way you have a better chance of winning.
5. An analogy is like a rented tuxedo. It never quite fits.
6. Spending a great deal of money to provide medical care for the aged is like wasting money on a car. When a car is all worn out, needs a new engine, transmission, and body work, it's just better to junk it. The same goes for people.
7. The vice president is the spare tire on the automobile of government.[48]
8. Just as it is rational for a single individual to maximize his or her happiness, so it is rational for the entire body of society to maximize the happiness of the whole.
9. The human mind is like a computer. It slows down when it has to confront too many alternatives.
10. The universe is like a clock. Both are systems of moving parts, set in a precise order, balanced, and having repeated, uniform motion. Since clocks have makers, it is likely that the universe had a maker.

48. Douglas R. Hofstadter, *Gödel, Escher, Bach: An Eternal Golden Braid* (New York: Basic Books, Inc., 1979), 670.

11. So, you say, government should be run like a business. Does this mean that many of the programs should fail the way small businesses do?

12. No one knows where the borderline between non-intelligent behavior and intelligent behavior lies; in fact, to suggest that a sharp borderline exists is probably silly. But essential abilities for intelligence are certainly:

    to respond to situations very flexibly;
    to take advantage of fortuitous circumstances;
    to make sense out of ambiguous or contradictory messages;
    to recognize the relative importance of different elements of a situation;
    to find similarities between situations despite differences which may separate them;
    to draw distinctions between situations despite similarities which may link them;
    to synthesize new concepts by taking old concepts and putting them together in new ways;
    to come up with ideas that are novel.

Here one runs up against a seeming paradox. Computers by their very nature are the most inflexible, desireless, rule-following of beasts. Fast though they may be, they are nonetheless the epitome of unconsciousness. How, then, can intelligent behavior be programmed? Isn't this the most blatant of contradictions in terms? One of the major theses of this book is that it is not a contradiction at all. One of the major purposes of this book is to urge each reader to confront the apparent contradiction head on, to savor it, to turn it over, to take it apart, to wallow in it, so that in the end the reader might emerge with new insights into the seemingly unbreachable gulf between the formal and the informal, the animate and the inanimate, the flexible and the inflexible.

This is what Artificial Intelligence (AI) research is all about. And the strange flavor of AI work is that people try to put together long sets of rules in strict formalisms which tell inflexible machines how to be flexible.

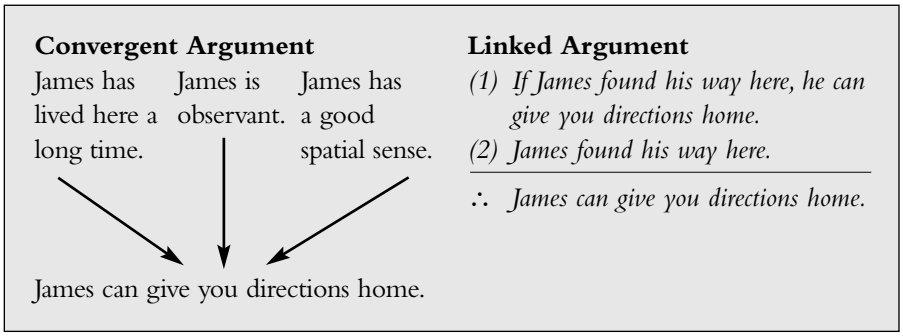
What sorts of "rules" could possibly capture all of what we think of as intelligent behavior, however? Certainly there must be rules on all sorts of different levels. There must be many "just plain" rules. There must be "metarules" to modify the "just plain" rules; then "meta-metarules" to modify the metarules, and so on. The flexibility of intelligence comes from the enormous number of different rules, and levels of rules. The reason that so many rules on so many different levels must exist is that in life, a creature is faced with millions of situations of completely different types. In some situations, there are stereotyped responses which require "just plain" rules. Some situations are mixtures of stereotyped situations—thus they require rules for deciding which of the "just plain" rules to apply. Some situations cannot be classified—thus there must exist rules for inventing new rules . . . and on and on. Without doubt, Strange Loops involving rules that change

themselves, directly or indirectly, are at the core of intelligence. Sometimes the complexity of our minds seems so overwhelming that one feels that there can be no solution to the problem of understanding intelligence—that it is wrong to think that rules of any sort govern a creature's behavior even if one takes "rule" in the multilevel sense described above.[49]

## Convergent Arguments

*Convergent* arguments are ones in which independent reasons are given for a conclusion, each providing some support. In chapter 1 we contrasted convergent arguments to *linked* arguments, in which the premises, combined together, support the conclusion, rather than each supporting it independently. The deductive arguments we have studied are linked arguments. The difference between linked and convergent arguments can be seen more clearly by considering the following examples:

***Example 8.24***


Convergent Argument
James has lived here a long time.
James is observant.
James has a good spatial sense.
James can give you directions home.
Linked Argument
(1) If James found his way here, he can give you directions home.
(2) James found his way here.
∴ James can give you directions home.

In the linked argument, the premise *If James found his way here, he can give you directions home* doesn't support the conclusion by itself, but when combined with *James found his way here*, it does. By contrast, each of the premises in the convergent argument supports the conclusion.

Are convergent arguments deductive or not? Initially, there seems to be a key difference between deductive and convergent arguments: In a deductively valid argument, the premises support the conclusion in a way that makes it impossible for the premises to be true and the conclusion false. If a deductive argument such as the linked one above adequately supports its conclusion (that James can give you directions home), then no counter-considerations, such as James now being

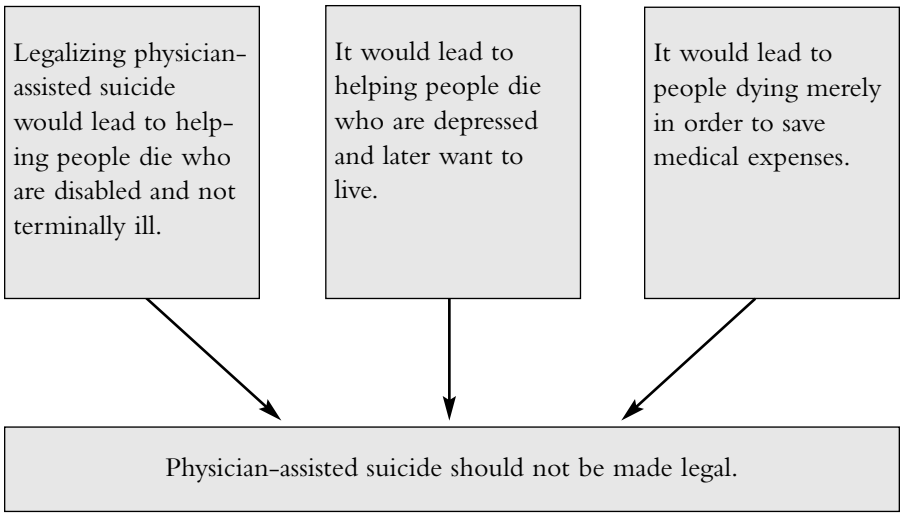
49. Douglas R. Hofstadter, *Gödel, Escher, Bach: An Eternal Golden Braid* (New York: Basic Books, Inc., 1979).

in a disoriented state, can outweigh the truth of this conclusion without making one of the supporting premises false. Convergent arguments appear to be different, in that the pro-considerations can all be granted as true but outweighed by counter-considerations. For example, the fact that James is now disoriented (maybe he has been misled about which direction he is facing) could make the conclusion false in Example 8.24 even though all the premises are true.

In reply to the claim that convergent arguments are nondeductive, someone could suggest that there is an implicit premise linking the stated premises to the conclusion, such as "If James has lived here a long time, is observant, and has a good spatial sense, then he can give you directions home." Once this premise is added, then if a counter-consideration makes the conclusion false, it also makes this linking premise false. This sort of move can always be used to make an argument deductive. After discussing a few more examples we will ask what is gained or lost by adding a linking premise to make convergent arguments deductive, as opposed to simply leaving them as they stand.

A common kind of convergent argument gives several independent reasons why we should or shouldn't do something. For example, chapter 2 presented an argument in which three separate reasons were given against legalizing physician-assisted suicide:

***Example 8.25***


Legalizing physician-assisted suicide would lead to helping people die who are disabled and not terminally ill.
It would lead to helping people die who are depressed and later want to live.
It would lead to people dying merely in order to save medical expenses.
Physician-assisted suicide should not be made legal.

Each reason is presented as lending some support to the conclusion: physician-assisted suicide should not be made legal. The argument leaves open the question of whether any of the reasons is strong enough by itself to support its conclusion. This leads to the question: How should we evaluate a convergent argument? If we can find reasons for doubting the premises, are we justified in rejecting the conclusion? If we can give reasons against the conclusion, how damaging is this to the argument?

**Evaluation of Convergent Versus Deductive Arguments** Evaluating convergent arguments is different from evaluating typical deductive arguments in two important ways. First, to criticize a convergent argument we may *either* cast doubt on the premises *or* raise counter-considerations against the conclusion. When we criticize argument 8.20, for example, one strategy would be to challenge the first and second premises by suggesting that restrictions against helping people die who are merely disabled or depressed could be built into the legislation that would permit physician-assisted suicide. Raising this point is no different from attacking the premises of a deductive argument. However, finding grounds for rejecting *some* premise(s) in a convergent argument isn't necessarily grounds for rejecting the entire argument. The remaining premise(s) might be judged strong enough to support the conclusion.

In addition to attacking the premises, it would also be appropriate to attack the conclusion—to give reasons in favor of legalizing physician-assisted suicide. We could point out that as long as physician-assisted suicide is kept illegal, many patients will go through a long period of suffering who would really rather die; and that for many of them this preference for dying is reasonable, not the result of temporary depression. We could claim that even if all three reasons in Example 8.25 are acknowledged, the benefit of preventing suffering is more important.

This second strategy of giving a reason against the conclusion is different from the strategy for criticizing a deductive argument, where giving reasons against the conclusion is irrelevant or inappropriate because if we can't find grounds for rejecting at least one premise, we are compelled to accept the conclusion.

Another way in which convergent arguments are evaluated differently is in judging how strong the connection is between the premises and conclusion. In contrast to deductive arguments, judging the strength of this connection is not a matter of seeing whether the argument fits a correct pattern. Rather, it is simply a matter of judging the weight of considerations in favor of the conclusion and considerations against. There is no general rule for doing this.

**Representing Convergent Arguments with Counter-Considerations** This metaphor of "judging the weight" of pros and cons suggests a way of diagramming convergent arguments that includes criticisms. We might think of setting out the pros on one side of a scale (or teeter-totter) and setting the cons on the other side. Oftentimes in an argumentative essay, the writer will actually lay out both sides of an argument and claim that the considerations on one side outweigh those on the other. This same diagramming device can be used to illustrate the entire presentation of this kind of argument, as in the following example.

**Dropouts Ought to Repay Part of Grant**[50]

Requiring college dropouts to repay a portion of a federal grant that allowed them to go to college makes sense.

Pell grants for low-income students have, until now, been handed out with no strings attached. The Department of Education has proposed requiring that students who don't finish their education give back a modest amount of their awards. Currently, the maximum grants are $3,125 an academic year.

The amount dropouts would have to repay is relatively small. Only students who didn't complete at least 60 percent of the academic term would be expected to return any money. The student wouldn't have to pay back tuition, nor even the full amount awarded beyond the tuition cost.

For instance, take a student given a grant of $1,500 for a college term. If tuition were $1,000 for that term, that amount would be subtracted from the total, leaving $500. If the student completed half the college term before dropping out, the amount is pro-rated to $250. Then, students are asked to pay back half that amount, or $125. That is hardly an onerous sum, even for a low-income student, considering how much the government has invested in the dropout's education.

But the symbolism is appropriate. Pell grants shouldn't be considered a free lunch, to be accepted or discarded frivolously. They should be used by low-income students to better themselves, to gain the education they need to make a better life and contribute to society.

Critics of the new federal rule have suggested that the threat of repayment could keep some deprived teen-agers from using the Pell grants to go to college. If the pay-back provision is explained properly and if the students want an education, that shouldn't be a problem.

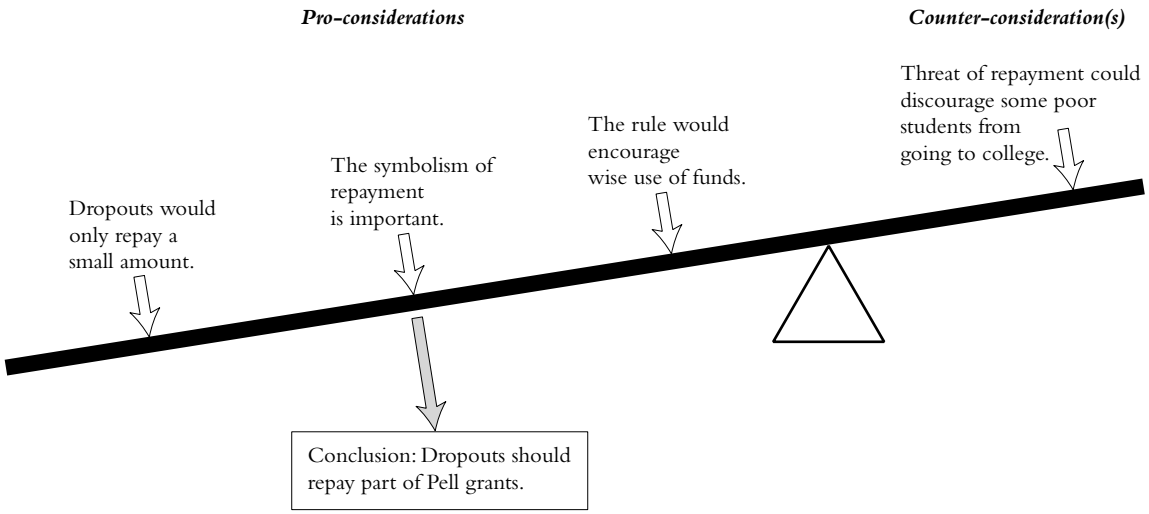
The rule should encourage the wise use of the Pell funds and underline the importance of working hard to stay in college.

Pell grants have enabled many people to go to college and graduate to become productive members of the workforce. It doesn't seem likely that the minimal repayment requirement being instituted by the Department of Education would have discouraged many of them. Neither should it hurt grant recipients in the future.

It is a good way to emphasize that students who take the grants have responsibilities as well as privileges.

50. Editorial, *Omaha World-Herald,* 6 November 1999.

**Diagram of Convergent Argument with Counter-Consideration in Example 8.26**


Pro-considerations
Counter-consideration(s)
Threat of repayment could discourage some poor students from going to college.
The rule would encourage wise use of funds.
The symbolism of repayment is important.
Dropouts would only repay a small amount.
Conclusion: Dropouts should repay part of Pell grants.

The arrow down from the pro-considerations to the conclusion represents what might be considered an implicit claim in the essay that the pros outweigh the cons.

We can return now to the question of what is gained by interpreting an argument as convergent as opposed to adding a linking if-then premise to make it deductive. Does a deductive interpretation invite counter-considerations? A deductivist could argue that any counter-considerations that are brought against the conclusion of a convergent argument can also be brought against the if-then premise of the deductive version. In Example 8.25, the claim that prevention of suffering outweighs the drawbacks of assisted suicide could be given as a reason against an implicit premise: *If assisted suicide has the three disadvantages that are listed, then it should not be made legal*. In Example 8.26, the claim that the threat of repayment could discourage some poor students from going to college could be given as a reason against an implicit premise: *If a requirement to repay Pell grants has these three advantages, then repayment should be required*.

The deductive reconstruction leaves room for these kinds of counter-considerations as criticisms, but it doesn't clearly invite them. The convergent approach sets out an issue as being a matter of pros versus cons: Here are some reasons in favor, now what are some reasons against? Which are stronger? The convergent approach more clearly invites counter-considerations, and this is an advantage. Furthermore, the convergent approach provides a way of picturing the two sides of an argument that are presented in an essay such as 8.26, and this two-sided approach is common in argumentative writing.

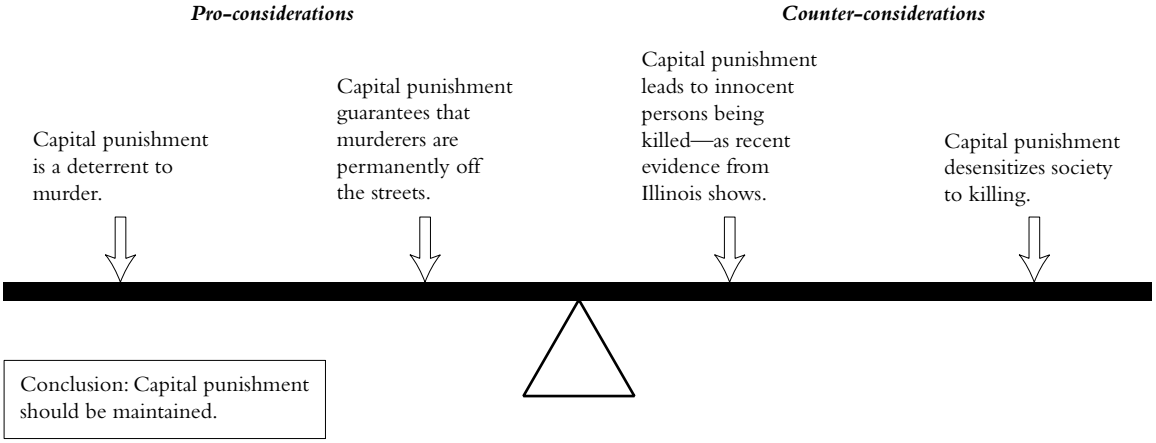
This advantage held by the convergent approach of inviting counter-considerations is even more apparent if we remember how difficult it was for the deductive approach to handle arguments such as: *We should lower the speed limit, because if we don't, there will be more highway deaths.* As was pointed out in chapter 4, a deductive reconstruction would add the premise: *There shouldn't be more highway deaths.* But this can't be taken to mean simply that **more highway deaths would be undesirable.** We have to construe this premise as asserting **that the disadvantage of highway deaths outweighs any good that would result from keeping the speed limit at its present level.** This interpretation is clearly not a natural one, so it is a disadvantage of the deductive approach that it does not naturally prompt us to make a kind of criticism that is clearly relevant, i.e., pointing to advantages of keeping the speed limit where it is.

On the other hand, the deductive approach has the advantage of clearly raising the question of whether the considerations advanced in the premises of an argument are supposed to be compelling. We suggest that the convergent approach is often better for *interpreting* what is being offered by the arguer(s) in the early stages of a discussion; while the deductive approach is better in the later stages, after the pros and cons are all on the table, and the critic is trying to decide finally what to believe. We are presenting the convergent approach in addition to the deductive approach that was laid out in detail chapters 2 through 6, so that you will have both of these critical tools available to you.

**Applying Criticism to Convergent Arguments: A Three-Step Process** The convergent approach is especially useful when you deal with complex exchanges or debates in which a variety of considerations, both pro and con, support or undermine a certain conclusion. Suppose you are listening to a forum on the topic of capital punishment. You might arrange the considerations you have heard as a convergent argument along these lines:

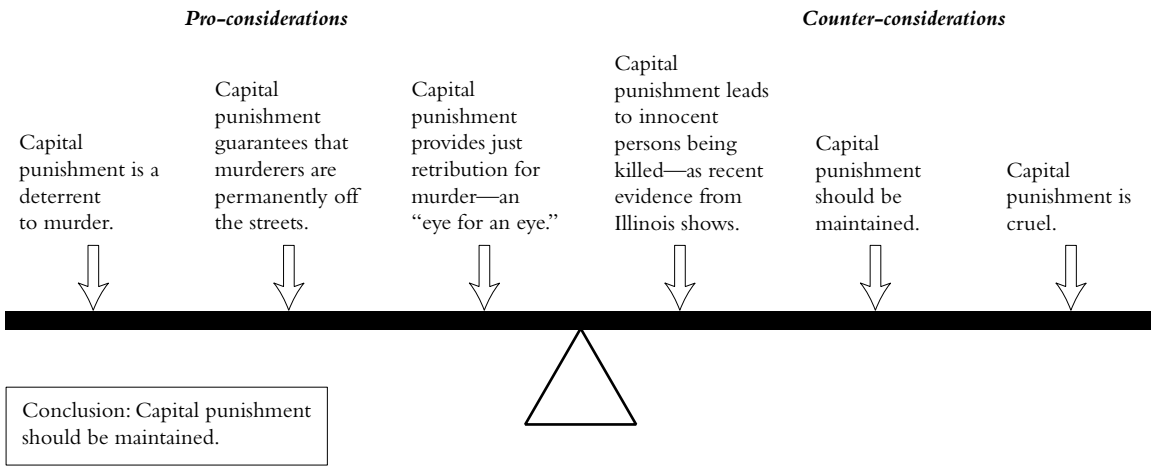
***Example 8.27***

**Initial State Representation**


Pro-considerations
Counter-considerations
Capital punishment is a deterrent to murder.
Capital punishment guarantees that murderers are permanently off the streets.
Capital punishment leads to innocent persons being killed—as recent evidence from Illinois shows.
Capital punishment desensitizes society to killing.
Conclusion: Capital punishment should be maintained.

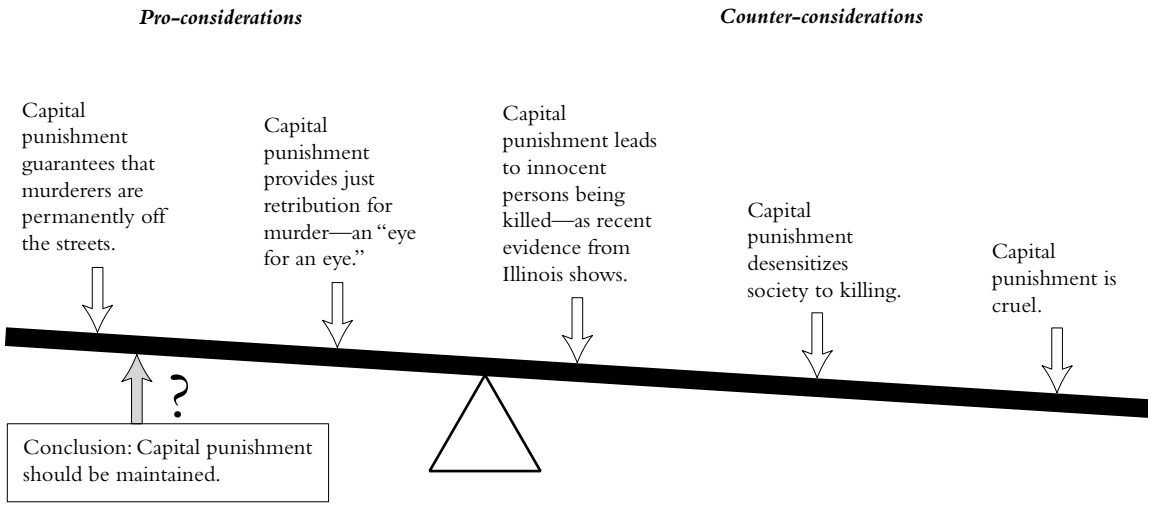
We can assess such a convergent argument through a three-step process: First, consider whether to add additional consideration. When you are criticizing an argument presented by someone else, these additional considerations are typically counter-considerations, but if you are deciding what to ultimately believe about an issue you might add pro-considerations as well. For example, the initial representation of the capital punishment argument can be transformed into the step 1 representation by adding some ethical considerations on both sides: just retribution and cruelty.

**Step 1: Adding Further Considerations**

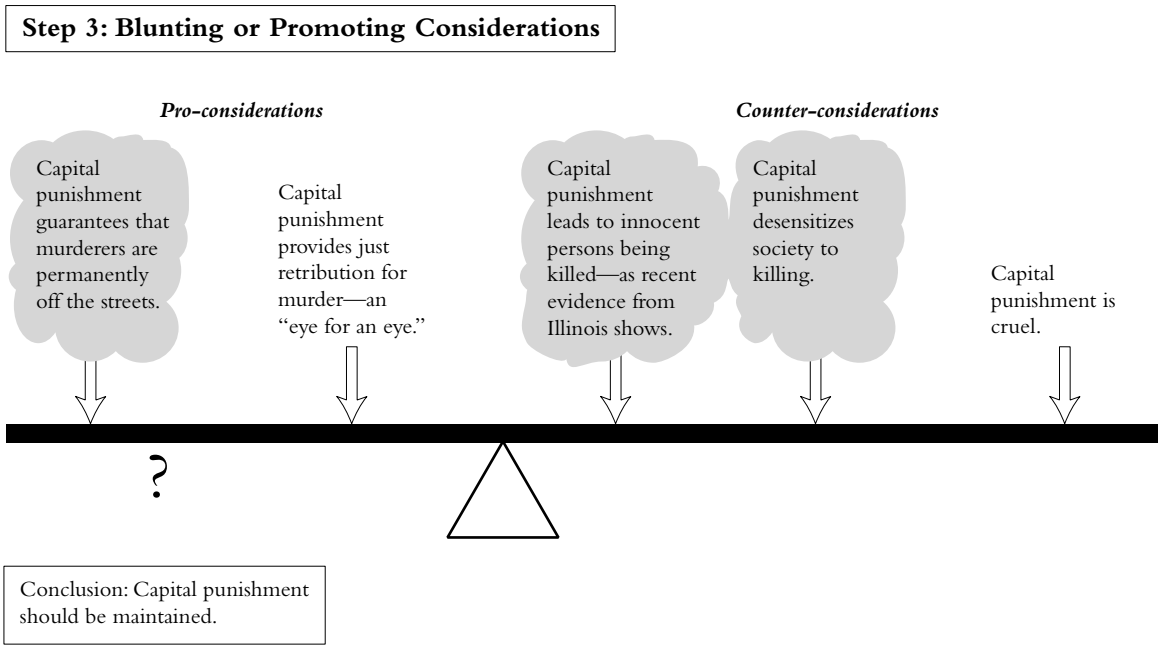

Pro-considerations
Counter-considerations
Capital punishment is a deterrent to murder.
Capital punishment guarantees that murderers are permanently off the streets.
Capital punishment provides just retribution for murder—an "eye for an eye."
Capital punishment leads to innocent persons being killed—as recent evidence from Illinois shows.
Capital punishment should be maintained.
Capital punishment is cruel.
Conclusion: Capital punishment should be maintained.

Once we have a more complete list of considerations, we should determine if the premises in support of the conclusion (or the counter-considerations) are true or at least acceptable. You might point out, for example, that it is not at all clear that capital punishment is a better deterrent than life imprisonment. States with comparable demographics, some of which have capital punishment and some of which do not, don't vary significantly in their murder rates.

**Step 2: Eliminating Doubtful Considerations**


Pro-considerations
Counter-considerations
Capital punishment guarantees that murderers are permanently off the streets.
Capital punishment provides just retribution for murder—an "eye for an eye."
Capital punishment leads to innocent persons being killed—as recent evidence from Illinois shows.
Capital punishment desensitizes society to killing.
Capital punishment is cruel.
?
Conclusion: Capital punishment should be maintained.

Just eliminating that pro-consideration doesn't alone tip the scales away from capital punishment. We can't just count up the considerations on either side and say that we have two premises in support and three against. What is important is how weighty the considerations are. We could blunt the pro-considerations by maintaining that although *capital punishment guarantees that murderers are permanently off the street*, this consideration is relatively insignificant because life without the possibility of parole does likewise or, on the other side, even though *capital punishment has, in the past, led to innocent persons being killed,* new forensic tests such as DNA matching at trial has significantly reduced the likelihood of such errors in the future. Similarly, even if we admit that *capital punishment desensitizes society to killing,* slightly, this factor is insignificant compared to the effect of violence on TV and in films.


Step 3: Blunting or Promoting Considerations
Pro-considerations
Counter-considerations
Capital punishment guarantees that murderers are permanently off the streets.
Capital punishment provides just retribution for murder—an "eye for an eye."
Capital punishment leads to innocent persons being killed—as recent evidence from Illinois shows.
Capital punishment desensitizes society to killing.
Capital punishment is cruel.
?
Conclusion: Capital punishment should be maintained.

Such a pattern of criticisms leaves us with two major considerations to weigh against each other: the claim of just retribution versus the claim of cruelty of punishment. Now we must consider whether either or both of these claims is acceptable, and if both are, we have to decide which is more important or weighty. There is no set of general rules that will tell you how to weigh the remaining considerations. Indeed, the weighing might be different in different contexts. But the three step process of criticism we have advanced in this section has focused attention on the most important elements to be ultimately weighed.[51] The following exercises will provide some practice in using this convergent approach.

**Criticizing Convergent Arguments**

1. Adding further considerations
2. Eliminating doubtful considerations
3. Blunting or promoting considerations

51. The problem of how to weigh them is no different than the problem the deductivist faces in deciding the whether to accept an if-then premise that connects the pro-consideration to the conclusion. A simple deductive reconstruction on the argument would be

*(1) If capital punishment provides just retribution, then capital punishment should be maintained.*

*(2) Capital punishment provides just retribution.*

*∴ Capital punishment should be maintained.*

## Exercise 8.6 Reconstructing and Criticizing Convergent Arguments

1. All of the following passages contain arguments that could be interpreted as convergent. Diagram them in the manner of Example 8.25 or 8.27. Arrange the premises horizontally, and write the conclusion beneath the premises. If the passage contains counter-considerations, include them in the diagram on the right side of a scale, as in Example 8.27. Then evaluate each argument, assessing individual premises as well as the relative weight of the pros and cons using the three-step process in the section.

   a. Teaching courses on the Web is a bad idea. Students don't experience face-to-face interaction with professors, there aren't adequate safeguards to insure that students do their own work, and many institutions that offer online courses have instructors of poor quality.

   b. Should the public schools maintain zero-tolerance policies for infractions like fighting and bringing a weapon to school? There are two good reasons against such policies. First, a mild, borderline infraction such as bringing a table knife in a lunchsack or punching a classmate on the shoulder could result in suspension—a much more severe penalty than is deserved. Second, zero tolerance is unrealistic given the lack of maturity of school-age children. It must be granted that a zero-tolerance policy would be a better deterrent, but that's not enough to outweigh these two potential injustices.

   c. Many people who were adopted as children would like to know the identity of their birth parents. But this benefit must be weighed against other considerations before we decide to give adoptees the legal right to this information. Would fewer women be willing to go through with a pregnancy and put their babies up for adoption if they don't have the option of remaining anonymous? Probably so. Furthermore, parents who adopt might prefer that their adopted children focus on them as their full-fledged parents, rather than dividing their concern between their adopted parents and their birth parents.

   d. The plea bargaining passage in chapter 1, page 9.

   e. A convergent argument from an editorial or column from a newspaper or Web site.

## *Review: Types of Nondeductive Arguments*

**Sampling Argument**
*Particular-to-general argument*

(1) In studies of 5,000 people, those who had more exposure to environmental smoke had a higher frequency of lung cancer.

---

(likely) People who have more exposure to environmental smoke generally have a higher frequency of lung cancer.

**Argument with Statistical Premises**
*General-to-particular argument*

(1) Most long-time, heavy smokers suffer from smoking-related health problems.
(2) Bruce is a long-time, heavy smoker.

---

(likely) Bruce will suffer from smoking-related health problems.

**Causal Argument**
*Particular-to-general argument with appropriate controlled condition*

(1) Exposure to computer-assisted reading instruction is correlated with improvement in reading (in a controlled experiment).

---

(likely) Computer-assisted reading instruction causes improvement in reading.

**Argument from Analogy**

The presidential team is like a football team. You don't tackle your own quarterback. If you are in the administration, you don't challenge the president.

**Convergent Argument**
*(multiple independent premises for (and possibly against) a conclusion)*

Legalizing physician-assisted suicide would lead to helping people die who are disabled and not terminally ill.

It would lead to helping people die who are depressed and later want to live.

It would lead to people dying merely in order to save medical expenses.

Physician-assisted suicide should not be made legal.

CHAPTER NINE

# *Explanation and the Criticism of Theories*

In this chapter, we focus on how to evaluate theories.[1] Since a premise of an argument is sometimes a theoretical statement, we are continuing our account of how to evaluate different kinds of premises by discussing how to evaluate theories. But the techniques for evaluating theories can be applied not only when a theory is used as premise in an argument to *persuade* you, but also when a theory is used to *explain* to you *why* something happens. In fact, even to evaluate a theory used in an argument to persuade, it is necessary to examine how well the theory can perform this role of explanation.

To better understand the distinction between these two ways a theory might be used—to persuade or to explain—consider the following examples. First, suppose you and a friend are discussing the relationship of a couple, Sarah and Tom. The point at issue is who has more decision-making power. Your friend might draw on a sociological theory to *persuade* you that Sarah has more power, by making the following argument:[2]

1. Specifically, we address empirical theories, which are used to explain or predict regularities (patterns of events) in the observable world. Chapter 7 discussed conceptual theories, which explain the meaning of concepts.

2. Adapted from *Marriage and Families: Making Choices and Facing Change* by Mary Ann Lamanna and Agnes Reidman.

***Example 9.1*** ***Theory Used as Premise in Argument***

***Theory Statement***

*(1) The partner who needs the other partner least has more decision-making power in a marriage.*

*(2) Sarah needs Tom less than he needs her.*

*∴ Sarah has more decision-making power than Tom in their marriage.*

In Example 9.1, the first premise expresses a theory, or at least a portion of a theory. To decide whether to accept the argument's conclusion, you would want to evaluate this theory.

Consider now a second kind of situation—one in which this same theory about power in marriage is used not to persuade but rather to explain. Suppose you and your friend are both well aware that Sarah has more decision-making power than Tom. What is at issue is not *whether* Sarah has more power, but *why*. Your friend notes that Sarah and Tom need all the money they earn to support their lifestyle, and that Sarah earns more and is more secure in her job than Tom. The friend claims that as a general pattern, if a couple depends more on one partner's earnings, then that partner has more say in the couple's decisions. Your friend goes on to advance the theory that such a partner has more power generally, and the reason Sarah has more power than Tom is that the partner who needs the other least is the one who has the most power. You wonder whether this really is the reason.

We could view the structure of this explanation in the following way:

***Example 9.2*** ***Theory Used to Explain a Pattern of Behavior***

***Theory Statement***

*The marriage partner who needs the other least has more decision-making power.*

***Regularity Being Explained***

*Generally, when a couple depends more on one partner's earnings, that partner makes more decisions.*

***Particular Events Being Explained***

*Sarah has made more decisions in the marriage than Tom.*

In chapter 8, we discussed the relationship between empirical generalizations (that is, statements of *regularity*) and observation of *particular events* such as those in the bottom two levels of Example 9.2. The observation of a representative sample of particular couples, their income pattern, and their decision-making behavior, could inductively support the generalization that when a couple depends more on one partner's earnings, that partner makes more decisions. In this chapter, we turn to the relationship between *regularities* and *theories,* or between statements such as the middle one in Example 9.2 and the top one.

Essentially, a theory is judged by how well it explains or predicts regularities—patterns of behavior such as the one claimed to occur in Example 9.2. Even when

a theoretical statement occurs as a premise of an argument rather than in an explanatory passage, it must be evaluated in terms of how well it would succeed in predicting and explaining regularities. In order to evaluate the theory that is used as a premise in Example 9.1—that the partner with less need has more power—it would be necessary to judge how well this theory can perform in explaining patterns of behavior such as the one stated in Example 9.2 (if it is a pattern that does in fact occur). It is for this reason that this chapter focuses on the explanatory role of theories. We will return in chapter 10 to the role of theories as premises of arguments.

## "That's *Just* a Theory"

Before we discuss how to identify and evaluate theories, we should address a common misconception about theories. It is sometimes believed that simply to identify a statement as a theory is grounds for rejecting it. This view is expressed when someone dismisses a claim by saying, "That's just a theory." In fact, some theories are well supported by evidence and are deserving of belief, while other theories are not. It must be admitted that the evidence for theories is less direct and less conclusive than is the evidence for particular, concrete assertions about the world. But it does not follow that no theory deserves belief; and it certainly does not follow that all theories are equally doubtful.

Consider for example some theories that have been used to explain the spread of disease. At one time in history, people explained the onset of disease by appeal to an act of God or correlatively to the moral fault of those who became sick.[3] We might call these the Divine Intervention or Moral Fault theories of disease. Most of us today embrace another theory—the Germ Theory—of disease (at least for a wide variety of diseases). According to this theory, disease symptoms are typically caused by the presence of large numbers of germs (now called viruses and bacteria). Such a theory allows us to explain why lack of hygiene leads to the spread of disease: lack of hygiene promotes the transmission of germs from one person to another.

If all theories were to be dismissed simply because they were theories, we would have to be equally doubtful of the Germ Theory and the Moral Fault Theory of disease. Clearly, this is not justified. Some theories are more deserving of belief, some are less so. Our aim is to improve your ability to identify and evaluate theories. Criticism of technical theories that are well developed by scientific

3. This contrast assumes a simple connection between divine judgment of moral fault and divine punishment: disease. A more elaborate version of the divine retribution theory might be compatible with the Germ Theory of Disease. God, it could be said, uses natural means, germs, for His purposes.

research usually requires special expertise or at least sustained efforts that few of us have the ability to marshal. Nevertheless, we are regaled on a regular basis by less-well-developed theories about which we possess sufficient expertise or knowledge. Even though this chapter will use theories of this sort as examples, the approach we present could be used to understand and evaluate more sophisticated theories as well.

## Picking Out Theories

Actual passages containing theories are not always easy to interpret. When presented with passages such as Example 9.3, in which a theory is used to provide explanation, the general tactic for identifying theory statements is to determine *what is explained* and *what does the explaining.* When this is difficult, it is helpful to look for *indicator words.* Some common words to look for are *because, accounts for*, or *explains.* Here is an example.

***Example 9.3***

*The political boss and his political machine flourished in cities like Chicago even after the age of reform in the early part of this century, because political patronage served to integrate new immigrants into American life. After the New Deal programs of the 1930s, this function was less important, and the political boss and his machine gradually died out though vestiges remained until the 1970s.*[4]

Here the word *because* indicates that what precedes it is explained by what follows it. The success of the institution of political bossism in American cities is explained by the theory that political bosses served an essential function in maintaining the social life of the country, namely, introducing and socializing new members.

As we noted in chapter 2, expressions such as *because* and *for the reason that* can sometimes indicate the premise of an argument. We are now pointing out that these same expressions—*because* and *for the reason that*—can also indicate an explanation. The difference is that the premise of an argument is presented to *convince* someone of a conclusion. By contrast, an explanation is presented not to convince the audience of something, but rather to say *why* it happened. For example, consider the statement *Alice quit going out with Miguel, because he is always late*. This would not be offered to convince the listener that Alice went out with Miguel, but rather to say *why* this occurred.

Another common device for calling attention to theories is the explicit use of the *why?* question. The answer to the question presents a theory.

4. Adapted from Robert Merton, *Social Theory and Social Structure* (Free Press: New York, 1968), 130–131.

***Example 9.4*** *Why did the political bosses continue to have power in U.S. cities long after the Progressive Era that brought reform to many other aspects of U.S. government? Quite simply, they served an essential function in bringing new immigrants into the social life of the country in a period that had no other social welfare programs.*

In addition to this main strategy of seeing what statement does the explaining, three further aids can be used for identifying theories:

**Identifying Theories**

**Main Strategy: Look for statements that explain why regularities occur. (Indicator words such as "why," "because," "explains," "accounts for" can help.)**

**Additional Features That Help Identify Theories**

1. Theories typically have a *broader scope* than that which they explain; many regularities can be explained by the same theory.
2. Theories are more *remote from direct evidence* than the events or processes they can be used to explain.
3. Theories commonly use *specialized or technical language.*

**Theories Have Broader Scope** We can sometimes identify a theory by noting that it is capable of providing an explanation for more than one pattern or regularity. The Germ Theory accounts for the transmission of such diverse diseases as syphilis, stomach flu, leprosy, and athlete's foot. Newton's laws (theory) of motion helped explain phenomena as disparate as the movement of the planets, the falling of objects like apples, the trajectory of cannonballs, and the swing of clock pendulums. Such theories have especially wide scope; they explain a wide range of phenomena. This feature helps us identify the theory in the following passage.

***Example 9.5*** *People living alone are more likely to commit suicide than those living with others. Social support helps a person overcome the stress and pain that all people confront in life. This relief is not available to people living alone. Similarly, religions like Catholicism that promote community have a lower suicide rate than Protestant faiths such as Lutheranism that are less community-oriented.*[5]

Here the theory that *social support* helps overcome stress can be identified by virtue of its scope. It applies to both the suicide rate of people living alone and to the suicide rate of members of certain religions. Further, such a theory of social

5. Adapted from Emile Durkheim, *Suicide.*

support would apply, presumably, not merely to suicide but to a variety of other psychological conditions.

**Theories Are More Remote from Evidence** Germs (bacteria and viruses) are unobservable to the unaided sense, while the symptoms—high fever, headache, vomiting, and so on—that are explained by the Germ Theory can be observed directly. This is a natural consequence of the fact that theories are constructed to explain events or processes whose occurrence is puzzling to us; we theorize in the first place by trying to get at what is "behind" the apparent symptoms or effects, since their explanation is not evident on the surface. One reason theories can have broader scope than what they explain is that they use concepts less closely tied to observation or other concrete,[6] direct evidence. In Example 9.5, social support is more remote from direct evidence than instances of committing suicide, living alone, or practicing Protestantism (although in any given case it might be difficult to determine whether a death was a suicide or if the person was a Protestant). Even the concept of stress might be somewhat more remote from direct evidence if we allow for the possibility of unrecognized stress that was not consciously felt. It is often difficult to determine whether one concept is more remote from direct evidence than another, but the flavor of this distinction can be illustrated by some cases. Imagine a person interested in voting behavior who is somehow able to watch Calvin's activities on election day. This observer might describe Calvin's behavior in a number of ways.

***Example 9.6***

*(1) The movement of Calvin's hand brought it about that the ballot was marked.*

*(2) Calvin cast a ballot.*

*(3) Calvin voted for his candidate.*

*(4) Calvin expressed his faith in the political process.*

*(5) Calvin exercised his political rights.*

*(6) Calvin overcame his political alienation.*

Such a list is arranged according to proximity to direct evidence. The most observable (directly evidential) statement is the first. The last statement is the most remote from direct evidence. One way of characterizing this range is to say that, as the statements become increasingly remote from direct evidence, they become more prone to error. Movement of the hand is readily detectable (at least to our well-placed observer). Casting a ballot might not be so readily apparent. After all, Calvin could be testing the marking equipment. Even if he is casting his

6. Some might prefer to mark this distinction by contrasting more abstract or theoretical concepts with more concrete or more observational ones.

ballot, he might not be voting, if by vote we mean "cast a ballot that is officially counted, for the person he intended." After all, if Calvin marked his ballot incorrectly or some corrupt official discarded it, he didn't really vote for his candidate.

As we move even further down the list, the possibility of error or disagreement among similarly placed observers increases. More remote—or, as they are sometimes called, more "theoretical"—concepts are more subject to dispute. We could probably get agreement about whether Calvin was expressing faith in the political process (although this might be complicated) more readily than whether he overcame alienation. A person's testimony about his faith in the process would count as evidence of the former, but a person might not be cognizant of his alienation.

Notice as well that as we move down the list the concepts cover an increasing variety of cases. There are ways of casting a ballot other than marking it (we could use a voting machine or punch card). And there are ways of voting other than using a ballot (voice voting or raising hands), other ways of expressing faith in the political process (working on a transition team), other ways of exercising political rights (picketing), and other ways of overcoming political alienation (working with a group to change a party platform). The use of concepts more remote from direct evidence enables statements of a theory to have a broader scope.

**Theories Use Specialized or Technical Language** Another clue we can use in identifying theory-statements is the use of specialized, technical or "theoretical" language. In creating or broadening a theory we often need to coin new terms to describe the range of objects, processes, or events we are grouping under the theory. This is most conspicuous in the natural sciences, where new terms are often created or old ones more precisely specified. Such terms are needed because no expression in the existing language has the scope required or because the language community has not developed a term for something so remote from direct evidence. It is sometimes possible to identify elements in the theory by finding such language.

***Example 9.7***

*Automobile engine blocks are apt to crack in very cold weather unless antifreeze is added to the radiator fluid. A block cracks when the pressure exerted by expanded ice exceeds the ultimate tensile strength of the metal out of which it is constructed. Antifreeze (usually ethylene glycol) freezes at much lower temperatures than water.*

In Example 9.7, the cracking of engine blocks is explained by a theory of sorts. The theory uses technical or "theoretical" expressions, such as *tensile strength* and *ethylene glycol,* whereas what it explains is characterized by more everyday terms, such as *engine block, cold weather*, and *antifreeze,* which are less remote from observational evidence. Even here, however, the term *engine block* is more specialized and technical than the expression *cold weather.*

**Levels of Explanation** Thus far we have looked at the way theories can explain patterns or regularities. But we are often interested in explaining particular conditions. For example, why has John, in particular, remained a bachelor? Sometimes we answer a question like this by offering an *explanatory argument*[7] of general-to-particular inductive form. The purpose of such an argument is to show that the particular event follows from a more general pattern of events. Suppose you have a friend John who has remained a bachelor. We might attempt to explain John's condition by considering events in his childhood and how they fit into a more general pattern of regularities concerning families:

***Example 9.8***

***Regularity*** *(1) Most men who have dominating mothers and weak fathers remain bachelors.*

*(2) John had a dominating mother and a weak father.*

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***Observed Data*** *(likely) John is a bachelor.*

Such an explanatory argument helps us understand John's condition by treating it as an instance of a general pattern. But we can also ask why this general pattern exists.

We might explain why the regularity in question occurs by appeal to some psychological theory. Sigmund Freud, for instance, might be taken as suggesting that strong mothers and weak fathers produce a situation in which the male child's attraction to his mother is not fully resolved, resulting in a condition in which the child grows up having difficulties relating to women.[8] This theory purports to explain why a certain family situation is likely to produce an adult who does not marry. This regularity in turn would help us understand and explain particular features of the world, such as why John is a bachelor.

This rough version of Freudian theory can be formulated more fully:

***Example 9.9***

($T_1$) *All male children have a strong, positive emotional attachment to their mothers and a hostile reaction to their fathers.* (This is called the Oedipus complex.)

($T_2$) *The Oedipus complex produces anxiety in male children.*

($T_3$) *In normal personality development, the male child identifies with his father.* (This identification reduces the anxiety caused by the Oedipus complex and allows the child to develop satisfactory relations with women later in life.)

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7. An *explanatory* argument differs from a deductive argument aimed at persuasion in that the conclusion is not taken to be in doubt. The person offering the argument assumes that the audience does not need to be persuaded that the conclusion is true. Rather, the argument is offered to explain why the state of affairs expressed in the conclusion exists.

8. Sigmund Freud (1856–1939), Austrian neurologist and founder of psychoanalysis, has suggested such an explanation with his theory of the Oedipus complex.

($T_4$) *If the mother is especially dominating and the father is weak, the child does not identify with the father, and the anxiety caused by the Oedipus complex is not reduced.* (As a result the child does not develop satisfactory relations with women later in life.)

($T_5$) *Bachelorhood (in our society) is often a sign of the inability to establish satisfactory relationships with women.*

We have at least two levels of explanation in Examples 9.8 and 9.9. In the former, a particular event is explained by appeal to a regularity captured by an empirical generalization. We might call this a theory of very narrow range—a theory about bachelors and their parents. This regularity or pattern is in turn explained by the latter, broader Freudian theory. We are not endorsing this Freudian theory as adequate (or indeed, even as an accurate representation of Freud's view), but it does illustrate how a narrower explanation of particular events fits into a larger scheme of explanation by theory.

The Freudian theory in Example 9.9 has only two "levels" of explanation. In more complex cases there may be many levels of explanation and hence many levels of theory. These correspond to increasingly broad answers to the question *why*? as in the series in Example 9.10.

***Example 9.10***

*Why did Bruce's engine block crack?*
*The water in it expanded when it froze.*

*Why does water expand when it freezes?*
*It forms a crystalline structure that occupies greater volume than water in the liquid phase.*

*Why does water form such a crystalline structure?*
*It consists of a number of molecules of $H_2O$ that have an angle of 105° between the two hydrogen atoms.*

*Why does the $H_2O$ molecule have this form?*
*Quantum mechanics tells us . . .*

This series of questions and responses provides explanation at increasingly higher levels of abstraction. We move from concrete notions, such as an engine block cracking, through a theory of water freezing, to a chemical theory of the hydrogen and oxygen atoms in a crystal, and ultimately to quantum mechanics and atomic physics. At each level a theory of broader scope with more abstract concepts helps explain a theory that is narrower, less abstract, and less remote from evidence.

## Exercise 9.1 Identifying Theories and Regularities

1. For each of the following pairs of statements, identify the theory-statement (the one that does the explaining) and the regularity statement (the pattern that is being explained).

   a. 1. Engine blocks containing water with no antifreeze tend to crack in very cold weather.
      2. Water expands when it freezes.

   b. 1. Social support helps people overcome pain and stress.
      2. People living alone are more likely to commit suicide.

   c. 1. Among college students in the 1970s and 1980s, women were less likely to smoke marijuana than men.
      2. American society is less tolerant of women engaging in deviant behavior than it is of men, which tends to constrain deviant behavior in women.

   d. 1. Individuals who are better adapted to their environment tend to survive and pass their genes on to succeeding generations.
      2. During the Industrial Revolution, as buildings in cities became covered with soot, populations of city-dwelling moths changed in color from white to gray.

   e. 1. The judge, prosecutor, and defense attorney form a workgroup that carries out shared goals such as disposing of its caseload.
      2. In the United States, a high percentage of criminal defendants plead guilty in plea bargains.

   f. 1. Educators tend to vote for Democrats.
      2. Americans identify with a group and vote for the party that represents that group's interests.

2. For each of the following passages, identify what is being explained as well as the theory or theories that are put forward to do the explaining. The theory in a given passage may consist of several statements and may be used to explain several regularities or particular events. As we have indicated, the mark of empirical theories is that they can be used to provide explanations. The statements that make up the theory can often be recognized in prose passages by certain clues: (1) the presence of indicator words, (2) a broader scope, (3) remoteness from direct evidence, and (4) specialized or technical language.

   a. During the 1980s, numerous banks and savings and loans in the United States failed. Between 1981 and 1984, over 150 failed. Before that time, since the Great Depression, the number of bank failures for a typical three-year period had been much lower than 150. Why this increase in failures? One reason that has been suggested is that banks had been largely deregulated, resulting in less-conservative practices by bankers willing to take risks.

b. It is well known that black Americans and members of labor unions tend to vote for Democratic candidates, and that businesspeople and religious fundamentalists tend to vote for Republican candidates. The reason is not difficult to find. In America people see themselves as primarily members of one group or another. When they go to vote they tend to choose parties that historically represent the interests of the groups of which they are a member and that have an ideology similar to theirs.

c. On January 20, 1942, leaders of the Nazi Third Reich gathered at a villa on the Wannsee in Berlin. . . . the German leadership had been trying out various approaches, in an effort to solve what they termed the "Jewish problem." . . . The meeting at Wannsee was designed to share this decision with those officials whose fateful job it would be to translate into action a plan for the execution of millions of people. Yet the records of the meetings never actually mention the genocide. . . . Ever since the truth of the death camps became known more or less in its entirety, humans of reason have asked how and why these events came to pass . . . intentionalist historians trace the genocide to explicit, long-term plans on the part of Hitler and his closest Nazi henchmen. The functionalist historians (sometimes called the structuralists) are less impressed by long-term consistency and the operation of direct "top-down" chains of command. They call attention instead to the struggle among rival camps within the Nazi hierarchy to gain the approval of Hitler and his inner circle; to a series of ad hoc actions that were deemed unsuccessful or insufficient; and the final desperate lunge toward a decision that would render all other options unnecessary.[9]

d. **Explanation X** Many explanations have been advanced for the political apathy of Generation X [the American generation born from 1965 to 1978], but none seems to tell the entire story. One theory holds that television, which the average child now watches for forty hours a week, is to blame for the cynicism and lack of civic education among the young. Another is that growing up during the Reagan and Bush presidencies, when government-bashing was the norm, led many Xers to internalize a negative attitude toward politics and the public sector. A third theory blames the breakdown of the traditional family, in which much of the child's civic sensitivity and partisan orientation is said to develop. And, of course, the incessant scandals in contemporary politics deserve some blame for driving young people into political hiding. Each of these theories undoubtedly holds some truth, but a simpler and more straightforward explanation is possible—namely, that young Americans are reacting in a perfectly rational manner to their circumstances, at least as they perceive them.

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9. Howard Gardner, *The Disciplined Mind* (New York: Simon & Schuster, 1999), 141, 180.

As they enter adulthood, this explanation goes, Xers are facing a particularly acute economic insecurity, which leads them to turn inward and pursue material well-being above all else. They see the outlines of very real problems ahead—fiscal, social, and environmental. But in the nation's political system they perceive no leadership on the issues that concern them; rather, they see self-serving politicians who continually indenture themselves to the highest bidders. So Xers have decided, for now, to tune out. After all, they ask, what's the point?[10]

e. The [U.S.] Constitution survived only because it was frequently adapted to fit the changing social balance of power. Measured by the society that followed, the [U.S.] Constitution envisaged by the men at the [Constitutional] Convention distributed its benefits and handicaps to the wrong groups. Fortunately, when the social balance of power they anticipated proved to be illusory, the constitutional system was altered to confer benefits and handicaps more in harmony with social balance of power.[11]

f. Natural selection is an immensely powerful yet beautifully simple theory that has held up remarkably well, under intense and unrelenting scrutiny and testing, for 135 years. In essence, natural selection locates the mechanism of evolutionary change in a "struggle" among organisms for reproductive success, leading to improved fit of population to changing environments. (Struggle is often a metaphorical description and need not be viewed as overt combat, guns blazing. Tactics for reproductive success include a variety of non-martial activities such as earlier and more frequent mating or better cooperation with partners in raising offspring.) Natural selection is therefore a principle of local adaptation, not of general advance or progress.[12]

g. The Greenhouse theory holds that an increase in the concentration of any of the greenhouse gases will lead to increased warming. No one disputes this, but the question is how much will it warm and are there any naturally occurring corrective phenomena? Nature is always unexpectedly complex, and we all too frequently underestimate its powers. Given the increases in carbon dioxide since the beginning of the Industrial Age, temperatures, according to the Greenhouse theory, should have gone up from 2 degrees to 4 degrees Centigrade over the past 100 years. They have not. The measurable overall increase is a trivial 0.5 degrees Centigrade or less. . . . Examination of temperature records, whether current or in the distant past, reveals a history of continual temperature oscillations. The

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10. Ted Halstead, "A Politics for Generation X," *The Atlantic Monthly*, 284#2, (August 1999), 34.
11. Robert Dahl, *A Preface to Democratic Theory* (Chicago: University of Chicago Press, 1956), 143.
12. Stephen Jay Gould, "The Evolution of Life on Earth," *Scientific American* (October 1994), 85.

facts do not support a claim of significant global warming. The . . . temperature rise . . . is probably part of the slow recovery from the Little Ice Age of 1450-1850.[13] **(Hint: What alternative theory to global warming does this passage offer?)**

h. The struggle for civil rights temporarily submerged the potential conflict between the two principles. All that black Americans needed, some thought, was an equal chance. When experience revealed that decades of deprivation had taken their toll, so that those disadvantaged before needed more than an equal chance now, the demands shifted to equal results for black people as a group. It was no longer enough to be allowed to run in the race; it became necessary for a proportionate number of blacks to win. Racial quotas, which had been anathema, became acceptable. From this shift in the paradigm of equality flowed a sequence of important consequences. First, white, liberal support split into factions, one favoring "opportunity" and one favoring "results." Second, civil rights groups such as the Congress of Racial Equality (CORE) and the Student Nonviolent Coordinating Committee (SNCC) rejected white leadership. Thus a cadre of white activists, accustomed to leadership and trained to represent deprived groups, was left out of work and free to lead the fight against risks perpetrated by giant corporations and big government on the public at large. The major manifestation of their leadership became the public interest group.[14]

i. Our curiosity is naturally prompted to inquire by what means the Christian faith obtained so remarkable a victory over the established religions of the earth. To this inquiry an obvious but satisfactory answer may be returned, that it was owing to the convincing evidence of the doctrine itself and to the ruling providence of its great Author. But as truth and reason seldom find so favorable a reception in the world, and as the wisdom of Providence frequently condescends to use the passions of mankind as instruments to execute its purpose, we may still be permitted (though with becoming submission) to ask, not indeed what were the first, but what were the secondary causes of the rapid growth of the Christian Church? It will, perhaps, appear that it was most effectually favored and assisted by five following causes: (i) The inflexible and, if we may use the expression, the intolerant zeal of the Christian—derived, it is true, from the Jewish religion but purified from the narrow and unsocial spirit which, instead of inviting, had deterred the Gentiles from embracing the law of Moses. (ii) The doctrine of a future life, improved by every addi-

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13. Dixey Lee Ray with Lou Guzzo, *Environmental Overkill: Whatever Happened to Common Sense?* (New York: HarperCollins, 1993), 17–21.

14. Mary Douglas and Aaron Wildavsky, *Risk and Culture* (Berkeley: University of California Press, 1983), 164. Reprinted with permission.

tional circumstance which could give weight and efficacy to that important truth. (iii) The miraculous powers ascribed to the primitive church. (iv) The pure and austere morals of the Christians. (v) The union and discipline of the Christian republic, which gradually formed an independent and increasing state in the heart of the Roman Empire.[15]

j. The impact of smoking on health is reflected by data in two areas: the longer you smoke the more likely you are to die, and the more you smoke per day the more likely you are to die. Overall mortality ratios[16] increase with the duration of the smoking habit. . . . The mortality ratios remain quite low, only slightly above the rates for nonsmokers for the first 5 to 15 years of the smoking habit, and then increase more rapidly. . . . Smokers of more than two packs of cigarettes a day have an overall mortality ratio that varies from 1.83 to 2.23. Similarly, mortality ratios increase with the amount smoked, as is indicated below.

**Results for the Study of Various Groups**

| *Number of cigarettes per day* | *British doctors* | *Males in 25 states* | *U.S. veterans* | *Japanese* | *Canadian pensioners* | *Males in 9 states* | *Calif. occupations* | *Swedish* |
|---|---|---|---|---|---|---|---|---|
| ***Nonsmokers*** | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** | **1.00** |
| ***1–9*** | **1.41 (1–15)** | **1.45** | **1.25** | | **1.41** | **1.34** | **1.44** | **1.20 (1–7)** |
| ***10–20*** | **1.57 (16–25)** | **1.75** | **1.51** | | **1.56** | **1.70** | **1.79** | **1.40 (8–15)** |
| ***21–39*** | **2.16 (>25)** | **1.90** | **1.69** | | **1.65 (>20)** | **1.96** | **2.27** | **1.80 (>16)** |
| ***40+*** | | **2.20** | **1.89** | | | **2.23** | **1.83** | |
| ***All smokers*** | **1.63** | **1.83** | **1.55** | **1.25** | **1.54** | **1.74** | **1.78** | **1.58** |

*Source:* U.S. Department of Health, Education and Welfare, *Smoking and Health: A Report of the Surgeon General* (Washington, DC: U.S. Government Printing Office, 1979), 2–17.

**Figure 9.1. Mortality ratios for males currently smoking cigarettes only, by amount smoked (Hint: What accounts for the mortality ratios listed in the figure?)**

k. Berkson suggests three explanations for the association [of smoking and the death rate from disease]. The first is that "the observed associations are spurious, that is they have no biological significance but are the result of interplay—of various subtle and complicated biases." The second . . . is that . . . "Persons who are nonsmokers, or relatively light smokers, are the

15. Edward Gibbon, "The Decline and Fall of the Roman Empire," *The Portable Gibbon,* ed. Deros Saunders (New York: Viking, 1952), 261–2. First published between 1776 and 1788. Reprinted with permission of the publisher.

16. Mortality ratios were obtained by dividing the death rate of a group of smokers by the death rate of a group of nonsmokers. For example, if 20 smokers out of 10,000 died and 10 nonsmokers out of 10,000 died, the mortality rate would be 2 (20 divided by 10).

kind of people who are biologically self-protective, and biologically this is correlated with robustness in meeting normal stress from disease generally." The third . . . is that smoking increases the "rate of living" . . . smokers at a given age are, biologically . . . older than their chronological age. "As a result, smokers (in particular, heavy smokers), are subject to the death rates of nonsmokers or relatively light smokers who are chronologically older. Diseases like cancer and heart disease, the death rates for which [increase with age] . . . will be considerably more prominent in heavy smokers than nonsmokers or relatively light smokers of the same age."[17]

l. Select an explanatory passage from a textbook, Web site, or other source. Clearly state the theory by listing in your own words the more theoretical statements that do the explaining. Provide as well the statements describing the regularities or observations that are explained.

## Criticism of Theories

Finding theories is only a first step toward our main task of evaluating them. Should we believe Freud's theory of the Oedipus Complex? Or the theory that the marriage partner who needs the other least has the most power? We discuss four common kinds of criticisms that can be raised against theories. In narrowing our focus to these four, we are assuming that the regularities that a theory is initially designed to explain do in fact occur. Of course, if they do not, then this also would be a reason for rejecting the theory.

If, for example, it turned out that men with strong, dominating mothers and weak fathers didn't tend to remain bachelors, then this would count against Freud's theory. It could well be that Freud mistakenly generalized this claim about bachelors and their parents from a small, unrepresentative sample of his patients. But we have already discussed (in chapter 8) how to evaluate empirical generalizations based on observation of a sample. Our focus in this chapter is on the evaluation of theories designed to explain the patterns expressed by these generalizations.

We divide criticisms of theories into two kinds: first-stage and second-stage criticisms. When a theory has been presented as a way of explaining some regularity, critics can initially challenge it by pointing out that there is an alternative way of explaining this same regularity. For example, it could be pointed out that if men who had strong dominating mothers and weak fathers tend to remain bachelors, we don't need the elaborate Freudian theory of the Oedipus complex to explain this regularity. Another plausible explanation is that men from this kind of family background received an unhappy impression of family life, so they tend to remain bachelors simply because they see single life as more enjoyable.

17. H. J. Eysenck, *The Cause and Effects of Smoking* (Beverly Hills, CA: Sage, 1980), 23.

Furthermore, critics can suggest that if a proposed theory were true, we would expect certain other regularities to occur—regularities that seem unlikely. Critics of the theory that power in marriage arises from relative need could suggest that if this theory were true, then when one member of a two-career couple suffers a loss of employment, the other would enjoy a substantial gain in power. The critic could question whether this pattern occurs.[18]

**Four Criticisms of Empirical Theories**

1. There is a plausible alternative theory.
2. The theory makes doubtful predictions.

} *First-Stage Criticisms*

3. Defense against doubtful predictions is *ad hoc.*
4. The theory is untestable.

} *Second-Stage Criticisms*

Second-stage criticisms typically occur later, as part of a dialogue between the theory's supporters and its critics. When critics claim that a theory is committed to predicting patterns of behavior that are unlikely, supporters of the theory often try to get around this apparently damaging evidence. They might alter their theory so that it no longer predicts the regularities that are unlikely. If this move is made by supporters, critics might claim that the defense is *ad hoc*. That is, the defensive move is made just to avoid this criticism. Alternatively, supporters might claim that their theory can't be tested in the particular ways that turn out to be damaging. In reply to this move, critics might raise the question of whether the concepts employed by the theory are applicable or testable at all. Occasionally this question of testability is raised by critics at the outset, when a theory has first been presented. However, we suggest first interpreting a theory charitably, lending some plausible, testable meaning to its terms and judging whether, as interpreted, the theory makes doubtful predictions. If a defender of the theory rejects this interpretation of the theory's terms, the charge of untestability can then be considered.

18. Of course, the criticism is not substantiated unless evidence can be gathered showing that these regularities probably do not occur.

## First-Stage Criticisms—Plausible Alternative; Doubtful Predictions

**1. There is a plausible alternative theory.** Just because the Greenhouse theory could explain why the global temperature has tended to rise in recent years, it doesn't follow that this is the only theory that could explain this pattern. As is noted in passage g of Exercise 9.1, this rise could also be explained by the theory that there are continual oscillations in global temperature. When the Greenhouse theory is presented to us and we see that it could explain this rise, the theory seems convincing. But as soon as we see that there is an alternative explanation, the original theory loses some of its grip. At this point, if all we know is that the temperature has risen and that this could be explained either by the Greenhouse effect or as a part of a larger pattern of rises and falls, then it is no more reasonable for us to choose one theory than the other. This is a first-stage criticism in that more information and reasoning is needed in order to decide which theory (if either) to accept.

The theory that political patronage served to integrate new immigrants into American life (Example 9.3) is intended to explain why political bosses and political machines flourished in cities like Chicago in the early part of this century. An alternative theory would be that opportunities for political corruption were presented first as the rule of law in cities that had difficulty keeping up with rapid social and economic changes, and that the underground economy of the Prohibition Era then allowed political machines to tighten their grip. Simply stating this theory does not make it true, but it does reveal how the same pattern—political machines in cities like Chicago—could initially be explained in more than one way. After the alternative theories are presented, choosing among them depends to a large degree on which one makes other predictions that turn out to be substantiated.[19]

**2. The theory makes doubtful predictions.** Because of the generality of theories, any empirical theory can be used to make many predictions. We must look beyond the regularities that the theory is designed to explain and ask what else we would expect to occur if the theory were true. To the extent that these predictions turn out to be false, the theory is discredited. The theory of the Oedipus complex would seem to predict that if a strong father figure is absent from the home, a male child will have difficulty relating to women. Suppose we conducted research on this issue and found that men from broken homes marry at the same rate as men from homes with a strong father figure. This finding would discredit the theory.

19. There are other criteria as well for choosing among theories, such as breadth of scope and systematic unity, that are discussed at the end of this chapter.

The prediction that men from broken homes would have difficulty relating to women is not one we can claim to be doubtful without conducting the appropriate research. We can say only that this is a criticism we *could* raise depending on our findings. In other cases, however, we might see that a theory is committed to predictions that, given our background knowledge, are simply implausible. The theory of voting behavior in Exercise 9.12b claims that people identify with a group, and that they tend to vote for a candidate whose party historically represents the interests of that group. This theory would seem to predict that unless large numbers of voters shift their group identification, the same party should continue to win election after election. But the winning party in U.S. presidential elections, for example, has shifted frequently. It is implausible that this was never due to a skillful campaign by a candidate who, as an individual, was appealing to voters; but always by a shift in group identification of voters that would align them with a different political party.

Making either of the criticisms we have just discussed requires inventiveness. There is no rote procedure for creating an alternative theory that would explain a pattern or regularity. Why did political machines flourish in cities like Chicago? We need to marshal our understanding of how politics works and discover a mechanism that could explain this. Some knowledge of the subject matter in question is necessary. And similarly, there is no automatic way of generating predictions from a theory. Some degree of inventiveness is needed to see that the theory of the Oedipus complex would imply that men from broken homes would have difficulty relating to women. Simply thinking about the voting-behavior theory doesn't automatically generate the prediction that the same party would keep winning elections unless there were significant shifts in the ways voters identified with groups. Even in this case, there is a little leap from the theory to the prediction.

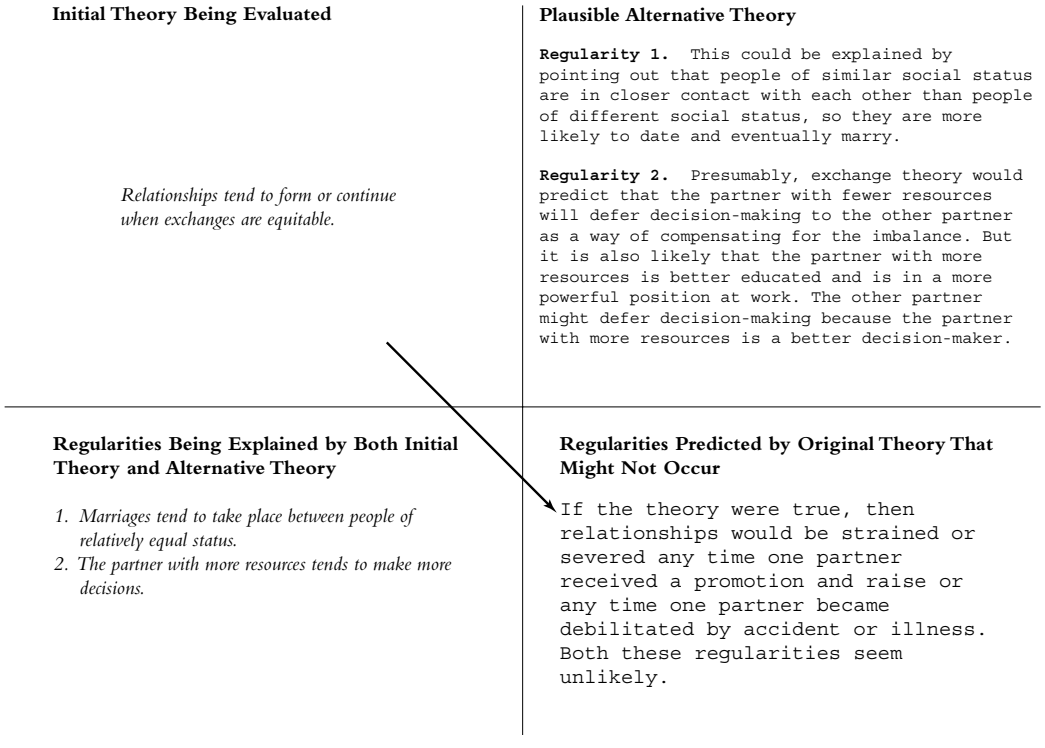
## Exercise 9.2 Applying First-Stage Criticisms to Theories

The following selections each contain at least one empirical theory and (at least implicitly) some statements describing regularities or patterns that the theory is supposed to explain. For each selection, create a two-column chart like the one displayed below that lists theory statements from the passage in the upper-left section and regularity statements—a list of the patterns being explained—in the lower left. Then fill in the sections on the right with appropriate criticisms—a plausible alternative theory in the upper right, and predicted regularities that might not occur in the lower right.

### Sample Passage

> The ideas of bargaining, market, and resources used to describe relationships such as marriage come to us from exchange theory. . . . The basic idea of exchange theory is that whether or not relationships form or continue depends on the rewards and costs they provide to the partners. Exchange theory must fight the human tendency to see family relationships in far more romantic and emotional terms. Yet, dating relationships, marriage and other committed partnerships, divorce, and even parent-child relationships show signs of being influenced by the relative assets of the parties. Money is power, and the children of wealthier parents are more likely to share their parents' values. Marriages tend to take place between people of equal status. Decision-making within a marriage, as well as decisions to divorce, are affected by the relative resources of the spouses. People without resources or alternatives to the relationship defer to the preferences of others, and are less likely to leave it.[20]

### Sample Criticisms


Initial Theory Being Evaluated
Relationships tend to form or continue when exchanges are equitable.
Plausible Alternative Theory
Regularity 1. This could be explained by pointing out that people of similar social status are in closer contact with each other than people of different social status, so they are more likely to date and eventually marry.
Regularity 2. Presumably, exchange theory would predict that the partner with fewer resources will defer decision-making to the other partner as a way of compensating for the imbalance. But it is also likely that the partner with more resources is better educated and is in a more powerful position at work. The other partner might defer decision-making because the partner with more resources is a better decision-maker.
Regularities Being Explained by Both Initial Theory and Alternative Theory
1. Marriages tend to take place between people of relatively equal status.
2. The partner with more resources tends to make more decisions.
Regularities Predicted by Original Theory That Might Not Occur
If the theory were true, then relationships would be strained or severed any time one partner received a promotion and raise or any time one partner became debilitated by accident or illness. Both these regularities seem unlikely.

20. Mary Ann Lamanna and Agnes Riedmann, *Marriage and Families,* 5th ed. (Belmont, CA: Wadsworth, Inc., 1994), 31 and 193.

**Passage 1**

**Explanation X**

**In Exercise 9.1 you identified the theory and the regularities in the following passage. Now go a step further and apply the first-stage criticisms, using a chart like the one on the previous page.**

Many explanations have been advanced for the political apathy of Generation X [the American generation born from 1965 to 1978], but none seems to tell the entire story. One theory holds that television, which the average child now watches for forty hours a week, is to blame for the cynicism and lack of civic education among the young. Another is that growing up during the Reagan and Bush presidencies, when government-bashing was the norm, led many Xers to internalize a negative attitude toward politics and the public sector. A third theory blames the breakdown of the traditional family, in which much of the child's civic sensitivity and partisan orientation is said to develop. And, of course, the incessant scandals in contemporary politics deserve some blame for driving young people into political hiding. Each of these theories undoubtedly holds some truth, but a simpler and more straightforward explanation is possible—namely, that young Americans are reacting in a perfectly rational manner to their circumstances, at least as they perceive them.

**Passage 2**

If we look at the history of colonialism in Africa and Asia we find that the earliest revolts against colonialism took place in the countries with the best, not the worst, social and economic conditions. Similarly, if we look at the history of riots in the United States—those springing from both racial conflict and labor disputes—we find that disorder occurred much more often in places where the social and economic conditions were better, rather than where they were worse. These counterintuitive results can be explained when we realize that the violence results not from oppression alone, but from the perception that better conditions are possible. Frustration comes when people first have their expectations increased, and then realize that these new, higher aims cannot be immediately satisfied.

**Passage 3**

French sociologist Emile Durkheim undertook a study of suicide. Included among his data was evidence from various European countries about the relationship of suicide to marital status and religion. For example, the recorded suicides for Catholics in Austria for 1852–1859 were 51.3 per million persons and 79.5 per million for Protestants. Similarly, in Prussia for the years 1849–1855 the recorded suicides were 49.6 per million for Catholics and 159.9 per million for Protestants. He also found that during this period the recorded suicides for unmarried men were 975 per million, while there were only 336 per million for men with children. He used this and other evidence to support the view that in general Catholics have a

lower recorded suicide rate than Protestants, and that married persons living with spouses have a lower recorded suicide rate than single persons living alone. Why? He believed that suicide rates are a function of unrelieved anxieties and stress. Being a member of a closely knit group, like the Catholic community or a strong family, provided a measure of social cohesion that gave psychic support to group members subjected to acute stress and anxieties. Durkheim's theory of suicide is another instance that shows that we can "get by with a little help from our friends"!

**Passage 4**

**What Is Gender?**

While sex refers to the biological dimension of being male or female, **gender** *refers to the social dimension of being male or female.* Two aspects of gender bear special mention—gender identity and gender role. **Gender identity** *is the sense of being male or female, which most children acquire by the time they are 3 years old.* A **gender role** *is a set of expectations that prescribe how females and males should think, act, and feel. . . .*

Parents are only one of the many sources through which the individual learns gender roles (Beal, 1994). Culture, schools, peers, the media, and other family members are others. Yet it is important to guard against swinging too far in this direction because—especially in the early years of development—parents are important influences on gender development.

**Identification and Social Learning Theories** Two prominent theories address the way children acquire masculine and feminine attitudes and behaviors from their parents. **Identification theory** *is the Freudian theory that the preschool child develops a sexual attraction to the opposite-sex parent. By approximately 5 or 6 years of age the child renounces this attraction because of anxious feelings. Subsequently, the child identifies with the same-sex parent, unconsciously adopting the same-sex parent's characteristics. . . .*

The **social learning theory of gender** *emphasizes that children's gender development occurs through observation and imitation of gender behavior, and through the rewards and punishments children experience for gender appropriate and inappropriate behavior.* Unlike identification theory, social learning theory argues that sexual attraction to parents is not involved in gender development.[21]

**Passage 5**

For this passage, state Gottman's criticism of the theory that active listening and validation enhance a relationship, and state Markham's defense of this theory. Discuss which position you favor. Finally, suggest a new theory to explain why couples tend to be happy when the male partner gives in.

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21. John W. Santrock, *Life-Span Development,* 7th ed., (McGraw-Hill Companies, 1999), 248.

**The Secret to a Happy Marriage? Men Giving In**[22]
***The Los Angeles Times***

Husbands, forget all that psychobabble about active listening and validation.

If you want your marriage to last for a long time, the newest advice from psychologists is quite simple: Just do what your wife says. Go ahead, give in to her.

Active listening, in which one partner paraphrases the other partner's concerns—"So what I hear you say is . . . "—is unnatural and requires too much of people in the midst of emotional conflict, says psychologist John Gottman of the University of Washington. "Asking that of couples is like requiring emotional gymnastics," he said.

Gottman and his colleagues studied 130 newlywed couples for six years in an effort to find ways to predict both marital success and failure.

Couples who used such techniques were no more likely to stay together than couples who did not, they report in the Journal of Marriage and Family, which is published by the National Council on Family Relations.

"We need to convey how shocked and surprised we were by these results for the active listening model," the team said in the article. In fact, Gottman and his colleagues have long recommended active listening to couples seeking counseling and had expected that its use would be a predictor of success in marriages.

That it was not a predictor, he said, suggests that its widespread use in marital counseling should be abandoned.

The marriages that did work well all had one thing in common—the husband was willing to give in to the wife.

"We found that only those newlywed men who are accepting of influence from their wives are ending up in happy, stable marriages," Gottman said. The autocrats who failed to listen to their wives' complaints, greeting them with stonewalling, contempt and belligerence, were doomed from the beginning, they found.

But the study did not let wives completely off the hook. Women who couched their complaints in a gentle, soothing, perhaps even humorous approach to the husband were more likely to have happy marriages than those who were more belligerent. "That type of (belligerent) response is even more exaggerated in violent marriages," he said.

The fact that happily married couples do not normally use active listening is not a surprise, according to psychologist Howard Markman of the University of

22. *Omaha World-Herald,* 21 February 1998. © 1998 Los Angeles Times. Reprinted by permission.

Denver, author of the 1994 book *Fighting For Your Marriage.* "We've found that in our own studies," he said.

In fact, he says that Gottman is setting up a "straw man" in the study of active listening and validation, which is another form of recognizing the legitimacy of a spouse's opinions. "When active listening is taught, it is not because happy couples use it," Markman said. "We use it to help couples disrupt the negative patterns that predict divorce."

Gottman said he is "very sympathetic" to that idea. "If you can genuinely listen and be empathetic when you are the target of the complaint, that can be very powerful," he said. But for the average person, he said, "it is just too hard. The average person meets anger with anger."

The differences between Gottman and Markman are typical of the turmoil in the field of marital counseling. A 1993 report said that marital therapy has a relapse rate so high "that the entire enterprise may be in a state of crisis." A recent Consumer Reports study indicated that people who underwent such therapy were the least satisfied among people who have undergone any form of psychotherapy.

Gottman's study was designed to identify the factors that naturally contribute to a successful marriage, so those might be brought into play in therapy, thereby making it more successful.

"If you want to change marriages," he said, "you have to talk about the 'emotionally intelligent' husband. Some men are really good at accepting a wife's influence, at finding something reasonable in a partner's complaint to agree with." That group represents perhaps a third of all men, he said.

## Second-Stage Criticisms—*ad Hoc* Defense; Untestability

**3. Defense against doubtful predictions is *ad hoc*.** Suppose I hold the Moral Fault theory of disease and you present damaging evidence against the theory. If I defend the theory solely by changing it to accommodate this damaging evidence, my defense is *ad hoc*. You might point to a number of cases in which infants, too young to be guilty of serious wrongdoing, contracted horrible diseases. If I replied that in these cases the infants are being punished for past sins of the parents, you could justifiably claim that my defense was *ad hoc*—that I was adding something to the theory just in order to get around the evidence against it. This is a second-stage criticism in that it would be presented after a defender of the theory has replied to the criticism that the theory produces doubtful predictions.

Another example of this *ad hoc* move is the defense of the Divine Creation theory of the origin of animal and plant species that was offered to escape the apparently conflicting evidence presented by Charles Darwin and other evolutionists that different species of animals and plants were generally located in rock strata farther from the surface than the fossils of more complex creatures. Some creationists replied that fossils had apparently been planted by the devil to tempt people away from their faith. If it were not for the way the existence of fossils threatened their theory, the creationists would have no reason to claim this particular origin for fossils.

In cases of *ad hoc* defense such as these, there is no independent reason given for the proposed addition to or alteration of the theory, aside from the fact that it would save the theory from damaging evidence. By contrast, scientists are sometimes justified in modifying their theories in the face of counter-evidence. Paleontologist Stephen J. Gould has argued, contrary to some versions of Darwin's theory of evolution, that evolutionary change is not gradual, but occurs in fits and starts. There may be periods of relatively rapid evolutionary change as the result of environmental catastrophe, such as a large meteor hitting the earth followed by periods of only gradual or limited change. We have found evidence that such a meteor hit the earth 65 million years ago (at the end of the "Age of Dinosaurs"). This alteration of classical Darwinian theory, however, is backed by additional evidence—for example, mammals evolved quite rapidly after the extinction of dinosaurs, which might well have been the indirect result of a large meteor striking the earth.

**4. The theory is untestable.** If a theory can't be tested by observation, even indirectly, then it can't be used to make predictions. There would be no way of knowing whether the predictions were correct. Suppose I hold the Moral Fault theory of disease, and you point out that, contrary to what the theory would predict, disease sometimes strikes people who are leading virtuous lives. I might stubbornly reply that each of these individuals must be guilty of some serious wrong that we can't detect, such as secretly wishing that someone be harmed. If we can't identify some procedure for determining whether these wishes occurred and whether they really distinguish these individuals from others who haven't wished for harm to others, then there is no way of knowing that disease occurs as punishment for moral fault.

The charge of untestability is a second-stage criticism in that it typically occurs after an attempt to test the theory has produced apparently damaging evidence.[23] Defenders of the theory might counter that the theory can't be tested

23. Even though the problem of testability is typically raised by opponents as a second-stage criticism (after apparently damaging evidence has been rejected by proponents of a theory), the problem is faced also at the time the theory is being developed. Unless proponents of a theory are willing to accept some way of making testable predictions from it, the theory faces the charge of not really being an *empirical* theory.

in that way, which raises the question: Can the theory be tested at all? It was suggested earlier that the theory of the Oedipus complex would seem to predict that men who had no father in the home would have difficulty relating to women. Suppose research indicated that this was not the case. A proponent of the theory might reply that presence or absence of a father in the home is not a good test of whether a child had identified with the father. Or the proponent could speculate that male children from broken homes must consistently identify with some older male as a father figure, whether or not this identification is observable. By making these defensive moves, the Freudian theorist exposes the theory to the charge of untestability. Unless there is a way of translating the theory's predictions into a description of what we can expect to observe, then the theory can't be accepted as truly predicting and explaining anything.

## Exercise 9.3 Applying Second-Stage Criticisms to Theories

1. The following passages contain responses to criticism of theories. In each case indicate (i) the theory being defended, (ii) the criticism (evidence) against which it is being defended, (iii) how the original theory is defended, and (iv) briefly discuss whether the defense appears to be *ad hoc.*

   a. Psi refers to a wide range of fascinating and controversial phenomena that include ESP ("mind reading"), psychokinesis ("mind over matter"), psychic healing, and precognitive dreams.

      *Why aren't psychics breaking the bank in Las Vegas casinos?* For a given psychic to make any notable differences in long-term casino profits, they would have to (a) understand the strategies of each game they play, (b) consistently play according to those strategies, (c) stop when they are ahead, and (d) consistently apply strong, reliable psi. Over the long term, casino profits are predictably stable; but, given that some psi effects are known to be genuine, in principle a good, consistent psychic (who knows how to play the casino games) might make some money by gambling. In addition, many people applying weak psi may cause small fluctuations in casino profits, but testing this would require analyzing an enormous amount of casino data, and such data is difficult to obtain.[24]

   b. The Bible is clear. The ancestors of every animal that ever lived were created during Creation week. Each basic animal type was created "after his kind" and all subsequent individual animals, including dinosaurs, descended from these created categories. . . .

24. Adapted from Psi Explorer Web site (http://psiexplorer.com/faq.htm).

The land and flying dinosaurs could only have survived on . . . [Noah's] Ark, only to disembark at the end of the flood into a strange and hostile world. We can surmise that the environmental conditions, with the sparse vegetation, the destruction of the pre-flood water canopy, and the temperature extremes during the ensuing Ice Age would have caused many animal types to become extinct, a process that continues today. Evidently the dinosaurs just didn't make it![25]

**(Hint: The biblical "theory" of Creation and the Flood (taken as an alternative scientific theory to evolution) might be taken as predicting that dinosaurs should also have survived the flood. They don't exist now. How does the author of the passage explain this? Is the defense *ad hoc*?)**

c. The extreme rarity of transitional forms in the fossil record persists as the trade secret of paleontology. The evolutionary trees that adorn our textbooks have data only at the tips and nodes of their branches; the rest is inference . . . Yet Darwin was so wedded to gradualism that he wagered his entire theory on a denial of this literal record. . . . Paleontologists have paid an exorbitant price for Darwin's argument. We fancy ourselves as the only true students of life's history, yet to preserve our favored account of evolution by natural selection we view our data as so bad that we almost never see the very process we profess to study. . . . The modern theory of evolution does not require gradual change. In fact, the operation of Darwinian processes should yield exactly what we see in the fossil record. It is gradualism that we must reject, not Darwinism.

   The history of most fossil species includes two features particularly inconsistent with gradualism:

   1. *Stasis.* Most species exhibit no directional change during their tenure on earth. They appear in the fossil record looking much the same as when they disappear; morphological change is usually limited and directionless.
   2. *Sudden appearance*. In any local area, a species does not arise gradually by the steady transformation of its ancestors; it appears all at once and "fully formed."[26]

d. *Since We See Galaxies Billions of Light-Years Away, Isn't the Universe Billions of Years Old?* The logic behind this common question has several hidden assumptions. Probably the most questionable assumption is that starlight has always traveled at the same speed. Has it?

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25. Adapted from John D. Morris, "Did Dinosaurs Survive The Flood?," Institute for Creation Research Web site (http://www.icr.org), *Vital Articles on Science/Creation* (May 1998).
26. Stephen Jay Gould, *The Panda's Thumb,* (New York: W. W. Norton, 1980), 181–2.

*Historical Measurements.* During the last 300 years, at least 164 separate measurements of the speed of light have been published. Sixteen different measurement techniques were used. Astronomer Barry Setterfield of Australia has studied these measurements, especially their precision and experimental errors. His results show that **the speed of light has apparently decreased so rapidly that experimental error cannot explain it!**[27]

e. *Can Radioisotope Dating Be Trusted?* For decades creation scientists have shown that the answer to this question is a clear NO! Its results have been shown to be inconsistent, discordant, unreliable, and frequently bizarre in any model. Creationists have, in particular, pointed out the weak assumptions on which the method is based, and the contradictory nature of its results.

*Assumption One:* The radioisotope decay rates have been constant throughout the past.

*Assumption Two:* No parent or daughter material has been added to or taken from the specimen.

*Assumption Three:* No daughter material was present at the start.

This assumption actually denies the possibility of creation when, in fact, God may have created an array of radioisotopes, which, if analyzed with false assumptions, could be misinterpreted as age.[28]

f. The following passages concern the "Taos Hum," a phenomenon described in the following way: "It was persistent. It was heard by only a small number of people. The sound was extremely low on the frequency scale—between 30 and 80 Hz. There was variation in how different hearers perceived the sound. Some heard a sound like the low rumbling of a truck while others heard a more steady, pulsing, yet still low sound. Interestingly, the investigators learned that the sound was not limited to the area around Taos, but was, in fact, heard at places all over the country and around the globe."[29]

(1) The Taos hum is a low-frequency sound that only some people can hear, so scientists are turning their attention to those who hear it. . . . A team of scientists and engineers reported Monday that sensitive instruments failed to reveal the source of the noise.

The team's investigation raised questions about electromagnetic fields, according to the report. "It was apparant that stray (electromag-

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27. Adapted from Walt Brown, *In the Beginning: Compelling Evidence for Creation and the Flood,* Center for Scientific Creation Web site (http://www.creationscience.com).

28. Adapted from John D. Morris, "Can Radioisotope Dating Be Trusted?," Institute for Creation Research Web site (http://www.icr.org), *Vital Articles on Science/Creation* (May 1997).

29. Adapted from Thomas Begich, "Sourcing the Taos Hum," as found on Earth Pulse Press Web site (http://www.earthpulse.com).

netic) fields along the ground were quite strong, even well away from any power lines," the report said. There was nothing conclusive linking them to the hum. But the scientists also said they couldn't eliminate the possibility that some people are unusually sensitive to the growing volume of electromagnetic noise from electronic gadgets, microwave communications, and cordless phones.[30]

(2) Congress directed scientists and observers from some of the most prestigious research institutes in the nation to look into a strange low frequency noise heard by residents in and around the small town of Taos, New Mexico. For years those who had heard the noise, often described by them as a "hum," had been looking for answers. . . . The hearers were . . . bothered by the disturbing nature of its existence: it did not seem like a natural phenomenon to them. . . . According to the August 23, 1993 "Taos Hum Investigation: Informal Report," most hearers initially experienced the hum with an "abrupt beginning, as if some device were switched on." Many of the hearers believed there was a connection between the hum, the military installations in and around New Mexico, and the Department of Defense or that the hum was somehow caused by the U. S. Navy's ELF (Extremely Low Frequency) stations in Northern Michigan. These suspicions made a civilian presence on the investigation team necessary.[31]

(3) COSMIC AWARENESS . . . indicates that essentially the [Taos] humming is that which relates to . . . those underground tunnels that have been worked on since the early 1940s in the United States. There are underground tunnels that are being connected from one place to another; these being created and built on behalf of, for and by the aliens, in connection with their contracts with the U.S. government. . . . Those machines that are used which create large circular tunnels underground as they grind through rock, through dirt, inching their way, like a giant worm-like motor . . . creature, create a great humming sound. It would not be a humming sound if you were up close; it would be a grinding sound, but these are one source of the sound. This Awareness indicates that the sounds in London generally have to do with the underground drilling or digging of caverns and most of the sounds in New Mexico and over to Florida, where these underground tunnels have been and are being built to bring two types of alien transportation beneath the earth of this nation. This Awareness

30. Adapted from Deborah Baker, "Next Taos Study to Focus on Those Who Hear Hum," Associated Press, *Denver Post,* 25 August 1993, as found on Taos Hum Web site (http://eskimo.com/~billb/hum/newshum2.txt).

31. Thomas Begich, op. cit.

indicates that pictures of these boring machines to create tunnels are available in the book *Alien Magic* by Hamilton. There is some description of these machines in that book also.[32] **(Hint: Consider whether the passages 1, 2, and 3 provide an *ad hoc* defense for the theory that the Taos Hum exists, in the face of the criticism that it is not heard by most people.)**

2. The following passages raise questions about Testability. Briefly describe whether, and if so, how, the following theories might be tested.

   a. Suppose we theorize that individual organisms have a personal space, a kind of "shell" surrounding them that is especially "intimate" and provokes "strong," generally negative reaction when another organism enters it. For example, human beings often react negatively when another (particularly a stranger) is "too" close. On this view, the boundary of their personal space is the distance at which they become uncomfortable and will typically move back a little or otherwise react to express their discomfort, so as to remove the errant individual from their personal space. The size of the personal space might vary by individual, gender, cultural background, context, and other characteristics.
   b. It has become increasingly difficult to find politicians who are morally virtuous. The culture of the last half of the twentieth century has served to undermine moral education. Of course, politicians want to appear morally upright and may even believe that they are, but ordinary citizens, even friends, of the politician can never be sure. A person may appear to be morally incorruptible, but fail to live up to moral standards when great temptation is placed before them.
   c. How are fossils to be explained? One early defender of the biblical account, a nineteenth-century naturalist named Philip Henry Gosse, suggested that God created the earth with the fossils already in it.[33]
   d. It is sometimes argued that "misery loves company"; unhappy people tend to congregate with each other.
   e. During the early 1990s, Seattle emerged as one of the hippest cities in the country. Grunge Rock contributed to this image. The hip has always been tied to the cutting edge of culture. It conveys sophistication and creativity. But what counts as hip depends on its being rare. Once it becomes commercialized it is no longer hip. The hipster is always way ahead of the pack. By the time a product reaches the market, it is no longer hip. . . .[34]
   f. Reexamine the passage on Psi phenomena, in exercise 9.31a above.

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32. "Cosmic Awareness on the Taos Hum," *Revelations of Awareness,* Issue 93-14.
33. Cited in Daisie Radner and Michael Radner, *Science and Unreason* (Belmont, CA: Wadsworth, 1982), 6.
34. Loosely based on a National Public Radio discussion, July 1999.

g. Parapsychologists D. Scott Rogo and Raymond Bayless have recently discovered a startling fact: that dozens of people have had telephone calls from the dead. . . . Their new book, *Phone Calls From the Dead*, describes fifty such cases. Unfortunately, if the person receiving the call realizes that he is speaking to a spirit from the Beyond, the call is usually over within seconds, they say. Some postmortem calls arrive, appropriately enough, over dead telephone lines. Rogo believes that these calls occur when a spirit manipulates electrical impulses in the phone to reproduce the sound of its own voice. "We've stumbled on a whole new method of psychic communication!" says Rogo.[35]

3. Use your favorite Web browser to find examples of a theory on one of the following topics: creationism, parapsychology, Taos hum, telekinesis, UFOs. Develop appropriate criticism of the passage you select.

## Review of Techniques for Criticizing Theories

We have described two initial ways of criticizing a theory: (1) by offering an alternative theory to explain the same patterns that the theory in question has been designed to explain, and (2) by suggesting some doubtful predictions that the theory in question would make. We have also discussed two further criticisms that are sometimes appropriate to raise after a theory has been defended against apparently damaging evidence: (1) that the defense is *ad hoc,* and (2) that the theory is untestable. Even though successful criticism of a well-developed scientific theory often requires sophisticated techniques and sustained research, attempting to apply the criticisms we have described can be helpful in understanding a theory and its implications.

**Four Criticisms of Empirical Theories**

1. There is a plausible alternative theory.
2. The theory makes doubtful predictions.

} *First-Stage Criticisms*

3. Defense against doubtful predictions is *ad hoc.*
4. The theory is untestable.

} *Second-Stage Criticisms*

35. *The Skeptical Inquirer* (Summer 1979): 15. As quoted in Radner and Radner, ibid.

**Central Concepts for Chapter 9**

**Empirical Theory**—a set of statements of broad scope that explains why patterns or regularities occur (Example: *Relationships tend to form and continue when exchanges are equitable.*)
**Regularity**—a pattern of behavior that is explained by a theory (Example: *Women who work tend to make more decisions in their families than women who do not.*)
**Observed Data**—the specific instances that form the basis for determining that a regularity occurs (Example: *Fran works and makes more decisions than Alice who does not.*)
**Explanation**—an attempt to indicate why or how something occurred, rather than to justify our belief that it did
**Alternative Theory**—a theory put forward as a more plausible alternative to a theory being criticized as an explanation of some regularity
**Ad Hoc Defense**—an attempt to save a theory being criticized by modifying it just in order to avoid some particular criticism
**Testability Criticism**—pointing out that there is no procedure for determining whether predictions made by the theory do in fact occur

## Exercise 9.4 Criticizing Empirical Theories in Longer Passages

The following seven selections range in length from a single paragraph to many pages. Each contains at least one empirical theory. In each case you should undertake these tasks:

1. List the most important aspects of the theory (that which is put forward in the passage to provide explanation) as well as any significant regularities or patterns explained or predicted by the theory.
2. Sketch criticisms of the theory using the techniques discussed in this chapter.
3. (Optional) If appropriate, assess some of the arguments in the passage.
4. (Optional) Write a full essay presenting the relevant parts of the theory and the appropriate regularities it explains. Then provide as strong a criticism as you can. Your essay should have the following parts:
   a. an *introduction* that states your thesis, that is, what you are claiming in the essay
   b. a succinct *presentation* of the aspects of the theory relevant to your criticism (for a complex theory, this section may consist of several paragraphs)
   c. a *criticism* section employing one or more of the types of criticism discussed in the book (again this may consist of several paragraphs)

d. a *conclusion* that may be merely a brief summary of your position and a presentation of positive comments about the theory or aspects of it, or further comments about an alternative theory

**Passage 1**

**Benefit of Handguns**[36]

What evidence is there that handguns in private hands protect the lives and property of innocent persons? First of all, there is the burglary data. The chart below sets forth crime and suicide rates for several nations, per 100,000 population.

**Crime and Death Rates in Various Countries**

| *Country* | *Homicide* | *Suicide* | *Total Death* | *Rape* | *Robbery* | *Burglary* |
|---|---|---|---|---|---|---|
| *Japan* | 0.8 | 21.1 | 21.9 | 1.6 | 1.8 | 231.2 |
| *England & Wales* | 1.1 | 8.6 | 9.7 | 2.7 | 44.6 | 1639.7 |
| *Scotland* | 1.7 | 10.2 | 11.9 | 4.4 | 86.9 | 2178.6 |
| *Canada* | 2.7 | 12.8 | 14.5 | 10.3 | 92.8 | 1420.6 |
| *Australia* | 2.5 | 11.8 | 14.3 | 13.8 | 83.6 | 1754.3 |
| *New Zealand* | 1.7 | 10.8 | 12.5 | 14.4 | 14.9 | 2243.1 |
| *Switzerland* | 1.1 | 21.4 | 20.5 | 5.8 | 224.2 | 976.8 |
| *United States* | 7.9 | 12.2 | 20.1 | 35.7 | 205.4 | 1263.7 |

**Figure 9.2. Crime and suicide rates for several nations, per 100,000 population**

While the United States has much more violent crime than the other nations (including crimes such as rape, which rarely involve guns), the United States anomalously has less burglary. In terms of burglaries perpetrated against occupied residences, the American advantage is even greater. In Canada, for example, a Toronto study found that 48 percent of burglaries were against occupied homes, and 21 percent involved a confrontation with the victim; only 13 percent of U.S. residential burglaries are attempted against occupied homes. Similarly, most Canadian residential burglaries occur in the nighttime, while American burglars are known to prefer daytime entry to reduce the risk of an armed confrontation. After Canada's stricter 1977 controls (which generally prohibited handgun possession for protection) took effect, the Canadian overall breaking and entering rate rose 25 percent, and surpassed the American rate, which had been declining. A 1982 British survey found 59 percent of attempted burglaries involved an occupied home (again compared to just 13 percent in the United States).

36. David B. Kopel, "Peril or Protection? The Risks and Benefits of Handgun Prohibition," *Saint Louis University Public Law Review,* vol. 12 (1993), 344–7. © 1993 by the Saint Louis University School of Law; David B. Kopel. Reprinted by permission of the publisher.

Why should American criminals, who have proven that they engage in murder, rape, and robbery at such a higher rate than their counterparts in other nations, display such a curious reluctance to perpetrate burglaries, particularly against occupied residences? Could the answer be that they are afraid of getting shot? When an American burglar strikes at an occupied residence, his chance of being shot is equal to his chance of being sent to jail. Accordingly, a significant reduction in the number of Americans keeping loaded handguns in the home could lead to a sharp increase in the burglary rate, and to many more burglaries perpetrated while victim families are present in the home. **(Hint: Apply first-stage criticisms (alternative theory and doubtful predictions). For this and the remaining passages, you will find it helpful to construct a chart such as the following, with the theory you are evaluating in the upper-left section, the regularities being explained in the lower-left section. Write your criticisms in the right-hand part of the chart: alternative theory or theories in the upper-right section and doubtful predictions in the lower-right section.)**

| **Initial Theory Being Evaluated** | **Plausible Alternative Theory** |
|---|---|
| *Handguns in private hands (in the United States) protect property and property owners' lives from burglars.* | |
| **Regularities Being Explained** | **Regularities Predicted by Original Theory That Might Not Occur** |
| 1. *The United States has a higher rate of murder, rape, and robbery but a lower burglary rate than other countries listed.*<br>2. *Burglaries in the United States tend to be committed during daylight hours.* | |

**Passage 2**

**Effect of Cohabitation Before Marriage**[37]

. . . evidence accumulated in recent years suggests that, contrary to Margaret Mead's hopes, "trial marriage" may have a negative effect on marital success. A panel study (Booth and Johnson 1988) based on a national sample of married people interviewed in 1980 and again in 1983 found that cohabitation was negatively related to supportive marital interaction and was associated with marital disagreement and increased probability of divorce. No sex difference or effect of length of marriage was found in this study.

The researchers thought that what some cohabitants bring to marriage might explain the negative relationship between cohabitation and successful marriage. Drug, money, legal, and unemployment problems; risk taking; parental disapproval; and lesser commitment to marriage were more characteristic of cohabitants than noncohabitants. Still, much remained unexplained by the data, suggesting that further research might find the cohabitation process itself to be contributing to marital weakness.

In a subsequent study, Thomson and Colella (1992) used 1988 National Survey of Families and Households (NSFH) data to analyze the relationship between prior cohabiting and the likelihood of divorce among 714 couples in first marriages. Researchers classified these couples according to whether and for how long they had lived together before marrying. Respondents were also asked the following question: "It is always difficult to predict what will happen in a marriage, but realistically, what do you think the chances are that you and your husband/wife will eventually separate or divorce?" Response options included: "very low," "low," "about even," "high," or "very high." [The table below] shows the results. Whereas 61.2 percent of those who had not cohabited said the likelihood of divorce was "very low," only 38.6 percent of those who had cohabited for two years or more said so. Generally, those who had cohabited were less satisfied with their marriages and less committed to the institution of marriage; their dissatisfaction increased with the length of time they had lived together before marrying. Wives who had cohabited had more individualistic views (as opposed to family-oriented views) than those who had not.

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37. Mary Ann Lamanna and Agnes Riedmann, *Marriage and Families*, 5th ed. (Belmont, CA: Wadsworth, Inc., 1994), 216–219. Reprinted with permission.

**Perceived Likelihood of Divorce by Cohabitation Experience**

| | | *Months Cohabited* | | | |
|---|---|---|---|---|---|
| | *Did Not Cohabit* | *1–5* | *6–11* | *12–23* | *24+* |
| *Likelihood of divorce* | | | | | |
| *Very Low* | 61.2% | 50.9% | 49.6% | 36.0% | 38.8% |
| *Low* | 27.0 | 28.2 | 29.6 | 48.2 | 39.2 |
| *Even or higher* | 11.8 | 20.9 | 20.8 | 15.8 | 22.0 |
| *Valid cases* | 714.0 | 90.0 | 57.0 | 68.0 | 75.0 |
| *Percent of couples* | 71.8 | 9.0 | 5.7 | 6.4 | 7.0 |

NOTE: Respondants were couples in their first union and marriage, married less than ten years.

**Figure 9.3. Perceived likelihood of divorce by couples in their first union of marriage**

Thomson and Colella (1992) did not disagree with explanations offered by Booth and Johnson (1988) but rather added to them. It is possible, they suggested, that the experience of cohabiting adversely affects subsequent marital quality and stability inasmuch as the experience actually weakens commitment because "successful" cohabitation (ending in marriage) demonstrates that reasonable alternatives to marriage exist" (Thomson and Colella (1992), 266). Put another way, experiencing cohabitation may lead to more individualistic attitudes and values. . . .

**Passage 3**

**What if Women Ran the World?**[38]

Both men and women participate in perpetuating the stereotypical gender identities that associate men with war and competition and women with peace and cooperation. As sophisticated feminists like Jean Bethke Elshtain have pointed out, the traditional dichotomy between the male "just warrior" marching to war and the female "beautiful soul" marching for peace is frequently transcended in practice by women intoxicated by war and by men repulsed by its cruelties. But like many stereotypes, it rests on a truth, amply confirmed by much of the new research in evolutionary biology. Wives and mothers can enthusiastically send their husbands and sons off to war; like Sioux women, they can question their manliness for failing to go into battle or themselves torture prisoners. But statistically speaking it is primarily men who enjoy the experience of aggression and the camaraderie it brings and who revel in the ritualization of war that is, as anthropologist Robin Fox puts it, another way of understanding diplomacy.

38. Francis Fukuyama, "What if Women Ran the World?," *Foreign Affairs* (September/October 1998), 33–39. Reprinted by permission of the publisher.

A truly matriarchal world, then, would be less prone to conflict and more conciliatory and cooperative than the one we inhabit now. Where the new biology parts company with feminism is in the causal explanation it gives for this difference in sex roles. The ongoing revolution in the life sciences has almost totally escaped the notice of much of the social sciences and humanities, particularly the parts of the academy concerned with feminism, postmodernism, cultural studies, and the like. While there are some feminists who believe that sex differences have a natural basis, by far the majority are committed to the idea that men and women are psychologically identical, and that any differences in behavior, with regard to violence or any other characteristic, are the result of some prior social construction passed on by the prevailing culture. . . .

Once one views international relations through the lens of sex and biology, it never again looks the same. . . . The basic social problem that any society faces is to control the aggressive tendencies of its young men. In hunter-gatherer societies, the vast preponderance of violence is over sex, a situation that continues to characterize domestic violent crime in contemporary postindustrial societies. Older men in the community have generally been responsible for socializing younger ones by ritualizing their aggression, often by directing it toward enemies outside the community. . . . Channeling aggression outside the community may not lower societies' overall rate of violence, but it at least offers them the possibility of domestic peace between wars.

The core of the feminist agenda for international politics seems fundamentally correct: the violent and aggressive tendencies of men have to be controlled, not simply by redirecting them to external aggression but by constraining those impulses through a web of norms, laws, agreements, contracts, and the like. In addition, more women need to be brought into the domain of international politics as leaders, officials, soldiers, and voters. Only by participating fully in global politics can women both defend their own interests and shift the underlying male agenda.

The feminization of world politics has, of course, been taking place gradually over the past hundred years, with very positive effects. Women have won the right to vote and participate in politics in all developed countries, as well as in many developing countries, and have exercised that right with increasing energy. In the United States and other rich countries, a pronounced gender gap with regard to foreign policy and national security issues endures. . . . It is difficult to know how to account for this gender gap; certainly, one cannot move from biology to voting behavior in a single step. Observers have suggested various reasons why women are less willing to use military force than men, including their role as mothers, the fact that many women are feminists (that is, they're committed to a left-of-center agenda that is generally hostile to U.S. intervention), and partisan affiliation (more women vote Democratic than men). It is unnecessary to know the reason for the correlation between gender and antimilitarism, however, to predict that increasing female political participation will probably make the

United States and other democracies less inclined to use power around the world as freely as they have in the past.

Will this shift toward a less status- and military-power-oriented world be a good thing? For relations between states in the so-called democratic zone of peace, the answer is yes. Consideration of gender adds a great deal to the vigorous and interesting debate over the correlation between democracy and peace that has taken place in the past decade. The "democratic peace" argument, which underlies the foreign policy of the Clinton administration as well as its predecessors, is that democracies tend not to fight one another. While the empirical claim has been contested, the correlation between the degree of consolidation of liberal democratic institutions and interdemocratic peace would seem to be one of the few nontrivial generalizations one can make about world politics. Democratic peace theorists have been less persuasive about the reasons democracies are pacific toward one another. The reasons usually cited—the rule of law, respect for individual rights, the commercial nature of most democracies, and the like—are undoubtedly correct. But there is another factor that has generally not been taken into account: developed democracies also tend to be more feminized than authoritarian states, in terms of expansion of female franchise and participation in political decision-making. It should therefore surprise no one that the historically unprecedented shift in the sexual basis of politics should lead to a change in international relations. . . .

The feminization of democratic politics will interact with other demographic trends in the next 50 years to produce important changes. . . . While the median age for America's population was in the mid-20s during the first few decades of the twentieth century, it will climb toward 40 by 2050. The change will be even more dramatic in Europe and Japan, where rates of immigration and fertility are lower. Under the U.N. Population Division's low-growth projections, the median age in Germany will be 55, in Japan 53, and in Italy 58.

The graying of the population has heretofore been discussed primarily in terms of the social security liability it will engender. But it carries a host of other social consequences as well, among them the emergence of elderly women as one of the most important voting blocs courted by mid-twenty-first-century politicians. . . .

By the middle of the next century, then, Europe will likely consist of rich, powerful, and democratic nations with rapidly shrinking populations of mostly elderly people where women will play important leadership roles. The United States, with its higher rates of immigration and fertility, will also have more women leaders but a substantially younger population. A much large and poorer part of the world will consist of states in Africa, the Middle East, and South Asia with younger, growing populations, led mostly by younger men.

**Passage 4**

**Science, Proof, and the Ancient Astronaut Hypothesis: The Case for von Däniken**[39]

It is common knowledge that it is both possible and probable that intelligent beings exist elsewhere in the universe. Even Carl Sagan admits that. To assume otherwise is to regress to the Middle Ages, when it was believed that the earth was the center of the universe and man the supreme creation.

Historian Will Durant, in his *Story of Civilization*, suggests that we are not necessarily the descendants of the primitive cultures to which archaeologists and anthropologists like to attribute our ancestry. His thesis, and the mysteries that science has not explained, suggest the possibility that ancient space travelers visited earth. No argument based on such data as problems of intergalactic travel and the vastness of space has yet proved that superior intelligence could not accomplish what we, with our few centuries of limited scientific technology and theory, believe to be impossible.

It is both possible and probable that ancient astronauts did visit earth. This cannot be denied unless one holds that evolution is impossible, or that there is no evolution and God created only us (a point that raises questions on which no evidence could be brought to bear), or that such evolution as there has been took place only on earth, or that except for us, there are no astronauts or other intelligences in the universe, or that the evidence is all in as to our origin, or that we have absolute knowledge about these things, and the like. Surely no enlightened person could hold such medieval ideas.

Unless we deny the possibility of evolution elsewhere in the universe or pretend to have an absolute knowledge regarding our past, we must recognize at least the possibility that technologically advanced civilizations may have arisen elsewhere and that they may have visited us in the remote past.

The ancient astronaut hypothesis, then, is at least possible. As to proof of von Däniken's theories, it must be noted that the ancient astronaut hypothesis cannot be expected to follow the rigid rules and standards of proof set for natural science. Its modes of proof are primarily like those in the social sciences, such as psychology, sociology, and anthropology. To expect formal rigidity in such informal disciplines is to demand what cannot be. Nevertheless, one would expect scientists to permit von Däniken to extrapolate from his data, since they themselves accept extrapolation as a kind of evidence permitting further advances in science.

What could constitute proof for the ancient astronaut hypothesis? We are not likely to find an ancient astronaut. As von Däniken points out, "crashed"

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39. Adapted from Pasqual S. Schievella, "Science, Proof and the Ancient Astronaut Hypothesis," *Philosophy of Science and the Occult*, ed. Patrick Grim (Albany: State University of New York Press, 1982), 268–270. Reprinted with permission of the author.

spaceships from the distant past would probably long ago have disintegrated or possibly have been carried away piecemeal. What then?

Von Däniken's thesis explains hitherto inexplicable mysteries, none of which has received any elucidation from academic minds fettered by prejudices and preconceptions. It is not fatal to the hypothesis that critics find errors. Taken as a whole, von Däniken's findings point convincingly to the likelihood of extraterrestrial interference in man's distant past. That is not to deny that von Däniken manipulates many of his facts to adapt them to the ancient astronaut hypothesis. But what scientist does not do this when he formulates a theory?

The ancient astronaut hypothesis is little different from most of recorded history. The hypothesis requires only "validation" of the reported data through correlation of those data with the unexplained and wondrous technical artifacts of the distant past. The proofs of the ancient astronaut hypothesis can be found in the logic of both possible and probable events, in the historical, even though predominantly religious, documents that are held in such high historical esteem throughout the world, and in the ancient artifacts that cannot be explained in terms of the supposed knowledge and capabilities of antiquity. Any mythologist will readily insist that much of mythology is but disguised history. There remains only to break the code of the expressions of antiquity and to translate them into the speech patterns of a space-age language. As George Sassoon explained, even the word *Glory* in the scriptures turns out to be a highly probable reference to a spacecraft. All these, studied as a body of coherently describable data, point to extraterrestrial intervention. Furthermore, the descriptions in ancient documents, when coupled with empirical data, considerably weaken the argument that terrestrials are responsible for those artifacts which obviously were beyond their linguistic, conceptual, and technical abilities. Let us consider some of those wonders. A few should suffice.

At the Bay of Pisco, south of Lima, Peru, there is an enormous trident engraved on the side of a hill pointing (we can now say with accuracy, thanks to the intensive research of Josef Blumrich) directly at a small island by the name of Isla Blanca. In addition, not far from the small city of Nazca, Peru, one can find what are now called the Nazca ground drawings. Inscribed on approximately thirty square miles of arid Nazca pampas are huge drawings of a spider, a monkey, a hummingbird, and the like. They are so large that they can be recognized only from the air. Other drawings could easily be mistaken for aircraft landing strips. Some are merely straight (often parallel) lines running across rough terrain and up mountainsides, appearing to deviate not an inch—sometimes almost ten kilometers (6.21 miles) long, as if cut by a laser beam from on high. As to their source and meanings, there are no accepted explanations. A NASA engineer, Robert Earle, claims to have determined that most of the lines point to important geographic locations on the earth.

Another unexplained mystery is that of the Terraces of Baalbek in Lebanon where huge stone blocks sixty feet long and said to weigh 2,000 tons have been

moved into place. They are so massive that even our modern technology could not handle them.

Then there are the so-called "fortress" walls at Sacsayhuaman, outside the city of Cusco in Peru. There are thousands of enormous irregularly shaped stones, many tons in weight, fitting together as closely and as neatly as the pieces of a jigsaw puzzle, without any kind of connecting adhesive. The thin edge of a sheet of paper could not be inserted between them.

Another marvel is the recessed quadrangular wall at Tiahuanacu, outside of La Paz, Bolivia. The inside surface is studded with sculptured faces apparently representing every racial type on earth. There are many hundreds of other unexplained mysteries which most scientists show no inclination to investigate. I shall mention only one more: the mystery of the existence of models of sophisticated aircraft. Some of these models show a separation space indicating the possible existence of nuclear engines. Such models, which are in museums throughout the world, have been tested and found to be aerodynamically accurate in design. They are amazingly interesting artifacts because they correlate so well with the many scriptural descriptions of flying machines emitting smoke, fire, and thunderous noise. Even if we accept the claim that all these things originated with terrestrial beings, we would be hard-pressed to explain the disappearance of such superior civilizations. We have found no documentary evidence or, indeed, evidence of any kind to support a terrestrial origin for such technological achievements.

It seems, then, as von Däniken reiterates, that it is time to bring to bear upon these fascinating mysteries, and the descriptions of them in the languages of antiquity, new perspectives and viable hypotheses made possible by the more sophisticated language and knowledge of our day.

If scientific and religious institutions would allow it, and if governments or foundations would advance funds to support it, researchers could feed data from all over the world into computers to determine the comparative similarities among empirical descriptions of "gods from space" and to determine whether these descriptions are, as the critics prefer to believe, nothing more than the creations of insane minds or over-fertile imaginations. Supplemented by computers, experts in comparative linguistics, translation, ancient cultures, and ancient languages should be able to determine whether the technical data, concepts, and achievements found in museums, existing at archaeological sites, and described in historical and religious documents could have originated with a prescientific people who spoke only non-technical and unsophisticated language. Surely such an effort would bring more probable results than will the expenditure of hundreds of millions of dollars from an impulse technology attempting to discover evidence of the existence of extraterrestrial intelligences—an effort with which I nevertheless heartily agree. However, there is even less of a "smidgen," to use a favorite word of Carl Sagan's, of evidence in space. In fact, there is *no* evidence except for the "evidence" of extraterrestrial interference (in the development of

man) right here on Earth as it had been offered throughout our history by ancient astronaut theorists.

As it stands now, the ancient astronaut hypothesis is primarily a historical hypothesis and peripherally a scientific one. It is founded on documentary and circumstantial evidence and, in some cases, on hard evidence that may not be denied except by stretching the facts beyond reason and probability.

## Empirical Theories and Explanation: A More Formal Approach

In previous sections of this chapter, we concentrated on the use of theories to explain *patterns* or *regularities* that are described by generalizations. But we can, as was mentioned, also explain the occurrence of particular events. Suppose that someone tries to explain why the lamentable crack in Bruce's engine block occurred (Example 9.10). The person may point out that the temperature dropped substantially below 32°F and chide Bruce for failing to put antifreeze into his radiator. If Bruce presses for an explanation, the person might remind him of the "law of nature" (the generalization) that water expands when it freezes.

Some philosophers of science have maintained that such an explanation of a particular event can be treated as an "argument" having the description of the event or condition to be explained as a conclusion and containing two sorts of premises: (1) generalizations that describe regularities or patterns (sometimes called "laws of nature") and (2) statements of particular relevant conditions. As we noted earlier in this chapter, although these explanations have the form of an argument, they have a different purpose than the standard arguments considered in much of the text. Those arguments aimed at establishing the *truth* of the conclusion. In an explanation, we assume that the conclusion is true (the event occurred). We want to understand *why* it occurred. Nevertheless, as in the case of the deductive argument reconstructions we examined in the first few chapters, such a representation of the argument pattern can help us make explicit assumptions and might serve to highlight possible inadequacies. Explanations of this type can be schematized as follows:

***Example 9.11*** ***An Explanatory Argument***[40]

***Regularities*** $R_1, R_2, R_3 \ldots$

***Conditions*** $C_1 \ \& \ C_2 \ \& \ C_3 \ldots$

***Description of Event Explained*** $E$

There is considerable controversy about the extent to which genuine *scientific explanations* fall under this model. Nevertheless, some cases seem to fit comfortably. Bruce's unhappy experience with a cracked engine block, for instance, can be explained in all its painful detail by listing some of its relevant regularities and conditions.

***Example 9.12***[41]

***Generalizations Expressing Some Observable Regularities***

($R_1$) *(Pure) water turns to ice and expands when it is subject to temperatures substantially below 32° Fahrenheit for a substantial amount of time.*

($R_2$) *The pressure exerted by expanding ice exceeds the ultimate tensile strength.*

($R_3$) *Whenever the ultimate tensile strength of a material is exceeded, it cracks (or breaks).*

***Conditions***

($C_1$) *His water-cooled engine was filled with pure water.*

($C_2$) *The temperature in his engine dropped substantially below 32°F for a substantial time.*

($C_3$) *His engine block is made of cast aluminum.*

---

($E$) *His engine block cracked.*

This model also provides a basis for understanding at least some cases of *prediction*. Essentially, a prediction can be seen as similar to an explanation except that we do not know that the event described in the conclusion has occurred. In the narrow sense of *predict,* predictions are made about the future. We could *predict* that Bruce's engine block *will* crack in Example 9.10 if we have reason to believe that conditions $C_1$, $C_2$, and $C_3$ *will* occur.

More broadly speaking, however, we can use the term *prediction* even when we are not talking about the future. In this sense we make a prediction about

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40. In this schema, the argument can be seen as resembling either a deductive argument, an inductive argument of the general-to-particular type (discussed in chapter 8), or even some other kind of inference. This model of an explanation is often called the *covering law model*. If it assumed that the argument is deductive, it is called the *deductive nomological* or *hypothetico-deductive model* and is particularly associated with the philosopher of science Carl Hempel.

41. Adapted from Barbara Leigh Smith, Karl F. Johnson, David Warren Paulsen, and Francis Shocket, *Political Research Methods* (Houghton Mifflin Company, 1976). Reprinted by permission of the publisher.

what we would find if we carried out a certain investigation, including past cases.[42] We could predict the existence of mineral deposits in eastern Washington given certain geological regularities (or laws) and statements about some specific geological formations in that area.[43]

Not just any argument of the form given in Example 9.11 will provide an adequate explanation or prediction. What's crucial is that it contains some generalization that is at least a candidate for being labeled a "law of nature." The causal generalizations like those discussed in chapter 8 are such candidates for "laws," and explanations containing them are called *causal explanations*. But laws come in other forms, such as the regularities about ice cited in Example 9.10. Such laws are principles that not only have held in the past but will hold for the future, not merely accidentally but as the result of fundamental interconnections in nature. One sign of such generalizations is that they are marks of what *would* happen even if it hasn't yet or won't. We know, by virtue of $R_1$, for example, that a glass of water left outside on that fateful night *would* have frozen. Similarly, we might know that we *would* die if we ever succumbed to the temptation to drink a gallon of paint.

Compare this to a generalization that reflects an *accidental* feature of the world. It might be true that everyone who goes into the Oval Office of the White House is under 6′11″ tall, but this gives us *no* grounds for supposing that some NBA basketball center over 7′ tall *would* be (or would become) under 6′11″ tall if he went into the Oval Office. Such an example is not even tempting.

Sometimes, as in the case of the fully controlled "true" experiment described in chapter 8, we can have evidence that strongly favors a causal generalization. But even so, we need to depend on some background assumptions or theories, at least about the instrumentation used. Such a controlled "true" experiment cannot actually be carried out, for instance, to test the hypothesis that "All U.S. presidents are men" (that is, male gender is a causal prerequisite to being president) in the strong sense that has implications about the future rather than merely summarizes the past.[44] In practice we have to consider the broader context in which we can discuss the effect of gender on being elected to high public office in the United States. In short, we have to consider a theory.

A second type of explanation (or prediction) is the causal narrative or story.[45] Here we typically *explain* (or predict) *how* something came about, what *causal mechanism* was involved. We might explain how it happened that water was running out of the tailpipe on Diane's car by the following story:

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42. A prediction about the past or about unobserved cases is sometimes called a *retrodiction*.

43. This prediction was actually made by a computer program called PROSPECTOR. Field work indicated that there were, in fact, minerals of the type predicted at this unexpected location.

44. We call it a "hypothesis" in this context because it is a generalization open to scrutiny or test.

45. Additional controversy exists about whether such causal narratives can be fitted into a complex version of the covering law model of explanation.

***Example 9.13***

*(1) When Diane brought her car in for routine servicing, the mechanic forgot to replace the radiator cap after checking the fluid level.*

*(2) When Diane drove home the water boiled out of the radiator.*

*(3) The engine overheated.*

*(4) The head was warped, enabling the water in the waterjacket to flow into the cylinders and out the manifold.*

*(5) The water ran from the manifold out the tailpipe.*

This sequence of events can be represented as a series of causes.

***Example 9.14***

*a caused b caused c caused d caused e*

*Failure to replace the cap caused the water to boil out, which caused the head to warp, which caused the water to flow into the cylinder, which caused it to run out the tailpipe.*

Note that even here our account presupposes some theory about the structure and operation of the automobile engine. It assumes, for instance, that water can move through the cylinder (of an operating engine) to the manifold if the head is warped.[46] These assumptions render the causal story plausible. Similarly, a detective in a mystery novel might explain how the crime was committed. But even here there are typically assumptions (theories) about how the murderer's mind worked, about how the murder weapon produced the wounds, and so on.

How can we represent the way theories enter into explanations and predictions? One tactic is to extend the model of an explanation presented in Example 9.11 to explain regularities in the same way these regularities explain particular occurrences—that is, by employing an argument that shows how the regularity follows from the theory and certain specific assumptions. Using this model, we have explained the regularity that water turns to ice and expands in temperatures below 32°F, when we show that it follows from a theory. But a theory typically does more than explain a single regularity; several known, predicted, and even unanticipated, potentially found regularities might fall within its scope.

In addition to statements of theory and regularities, we have identified a third level of particular pieces of evidence. Although it might be difficult to draw firm lines between these levels, they may be useful to you in picking out various kinds of statements in passages containing theories and explanations. Think of them as

46. Note that such causal stories can be criticized by pointing out that elements of the story did not occur—for example, the radiator cap might still be on, the head might not be warped, and so on; or we can note that there is no reason for believing that water can flow through the engine; or as we suggested in the previous section we can offer a more plausible alternative, such as that the drain valve leaked or that there was a hole in the exhaust system that allowed rain to flow in.

labels on an axis going from the more concrete and directly evidential to the more abstract and theoretical. There are two ways of looking at this relationship: from the top down, which distinguishes between what does the explaining and what gets explained, and from the bottom up, which distinguishes between what provides basic support and what ultimately gets supported. The process of explanation by theory is a "bootstraps" operation—like lifting yourself up by your bootstraps. A good explanation demands a well-supported theory, and the ability to explain items over a broad scope is a mark of a well-supported theory. These relationships are illustrated in Figure 9.4 below.

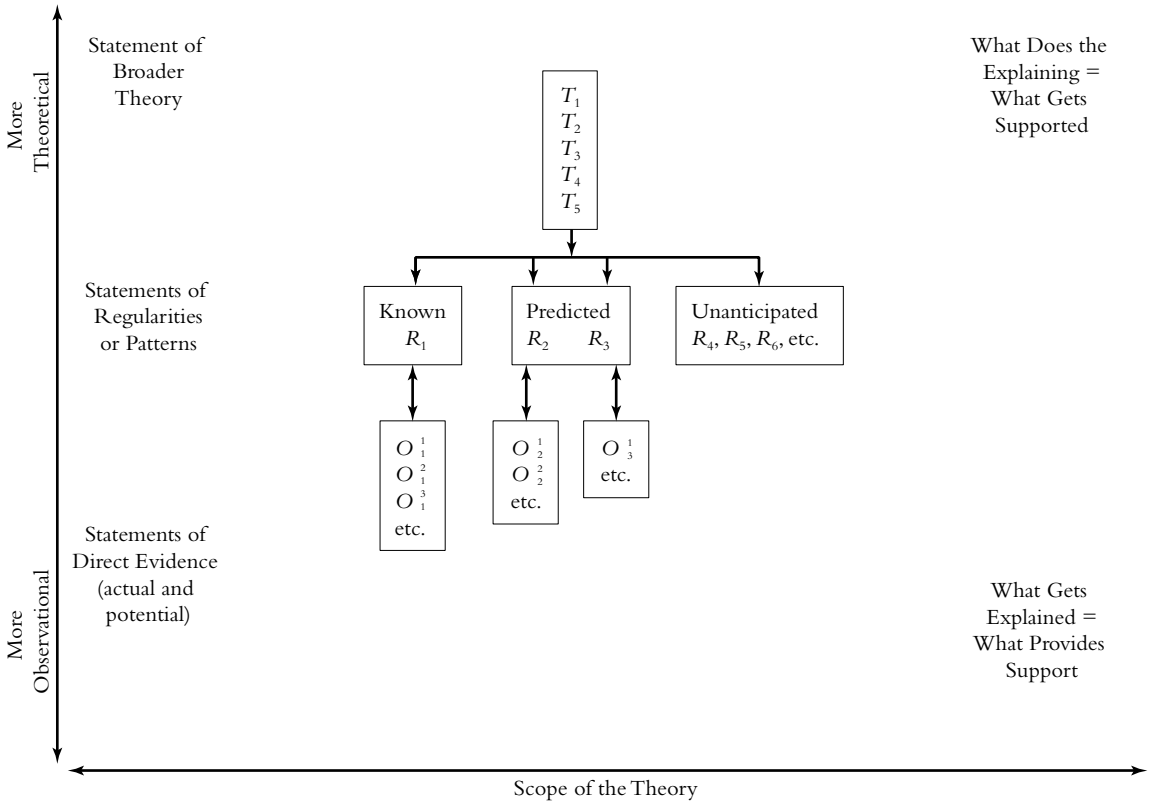
More Theoretical
More Observational
Statement of Broader Theory
Statements of Regularities or Patterns
Statements of Direct Evidence (actual and potential)
What Does the Explaining = What Gets Supported
What Gets Explained = What Provides Support
$T_1$ $T_2$ $T_3$ $T_4$ $T_5$
Known $R_1$
Predicted $R_2$ $R_3$
Unanticipated $R_4$, $R_5$, $R_6$, etc.
$O^{1}_{1}$ $O^{2}_{1}$ $O^{3}_{1}$ etc.
$O^{1}_{2}$ $O^{2}_{2}$ etc.
$O^{1}_{3}$ etc.
Scope of the Theory

**Figure 9.4 Model for Empirical Theories**

**Marks of a Successful Empirical Theory** We have discussed techniques for criticizing empirical theories and have emphasized isolating fairly obvious faults that might be brought into the dialogue process by those without extensive specialized or technical knowledge. But choice among theories, particularly by subject matter "experts," brings in some more refined criteria. Important among them is that a successful theory typically provides a common explanation

for a wide range of phenomena. The classic example is Newton's theory of gravitation explaining the orbits of planets around the sun and the moon around the earth; but the same theory that accounted for these regularities also had other applications. With a few additional assumptions it could be applied to explain the regular motion of pendulums as well as the parabolic path taken by cannonballs. The existence of these regularities supports the theory, and the theory in turn explains the regularities.

Several characteristics count as virtues in such successful theories:[47]

1. They have ***explanatory power***. They actually explain patterns we know or suspect to exist with some accuracy and precision.
2. They have ***broad scope***. They apply to a wide variety of diverse phenomena.
3. They are ***systematic.*** They consist of interconnected statements rather than an odd assemblage of loosely related items.
4. They are ***fruitful.*** They predict the existence of regularities that may not even have been suspected before the theory was propounded.

Nevertheless, at a given time there may be two different theories, both in some measure successful, covering some of the same phenomena. A number of studies indicate that police officers and prison guards measure high on various tests for authoritarian attitudes. Why? Two types of theories have been advanced. The first accounts for the pattern in terms of socialization. People coming into police and prison work are socialized with (informally taught) authoritarian attitudes. According to the second theory, people who already have authoritarian attitudes are drawn to police and prison work. Both these theories explain the occurrence of authoritarian attitudes, can be applied to other occupational areas, can be systematically developed, and are suggestive of additional research, but at the moment, it is not easy to decide between them.

Furthermore, even if one theory can be considered better than another on the basis of evidence available at a particular time, this evidence might come to be seen in a different light at some later time. Not only is current evidence itself open to reexamination, the future may disclose new evidence or provide a revolutionary new theory that will bring about the rejection of certain currently accepted beliefs. But the mere possibility that we might have to give up a well-established theory is no reason, in itself, to reject the current theory—after all, it is equally possible that we now have it at least approximately right. Every time

47. Various philosophers have included other criteria for a successful theory, such as simplicity and elegance.

you shut the door it is barely possible (although hardly likely) that the floor outside has collapsed without your knowledge, but this is no reason for acting as if the floor has collapsed behind you.

## Exercise 9.5 Putting Explanations Given by Empirical Theories into a "Standard Form"

Pick out statements of theory, regularity, and particular evidential data that occur in the following passages. Label the elements as in Figure 9.4.

### Passage 1

**A Star Named George**[48]

In the 570 million years since the beginning of an abundant fossil record of the earth's biota almost every species has become extinct. Until recently the extinctions were thought to come at a roughly constant rate; the great biological crisis of 65 million years ago that resulted in the disappearance of the dinosaurs was thought to be one of a mere handful of exceptions to the hypothesis of continuity. Now a careful statistical analysis of the extinctions of more than 500 families of marine animals shows the dinosaur extinction to be less the exception than the rule. The analysis, conducted by David M. Raup and J. John Sepkoski, Jr., of the University of Chicago, shows that the rate of extinctions over the past 250 million years has increased systematically every 26 million years; the most recent ones were some 13 million years ago. The striking regularity of the extinctions suggests an extraterrestrial cause, and an astrophysical model that explains the regularity has now been proposed by Richard A. Muller and Marc Davis of the University of California at Berkeley and by Piet Hut of the Institute for Advanced Study. If the model is in accord with reality, it would bring about a fundamental revision in the understanding of the solar system.

According to Muller and his colleagues, the sun is a member of a binary-star system. The sun's companion is most likely a faint dwarf star, perhaps a tenth the mass of the sun, that is now at a distance of about 2.4 light-years. It would

48. "A Star Named George," *Scientific American: Science and the Citizen,* April 1984. Copyright © 1984 by Scientific American, Inc. All rights reserved.

be straightforward to suppose the periodic extinctions were somehow caused by the passage of the companion through the solar system every 26 million years; indeed, one of Muller's initial hypotheses called for the companion to swing close enough to the sun to disturb the orbits of the asteroids between Mars and Jupiter and thereby subject the earth to an intensified planetoidal bombardment. That mechanism would not work, however, because an orbit with a 26-million-year period that passes so close to the sun would not be stable. Gravitational perturbations would probably cause the companion to miss the sun by 100 astronomical units on its second orbit. (An astronomical unit is the mean distance between the earth and the sun.)

In December of last year, meeting with Davis and Hut on the problem for the first time, Muller explained the apparent failure of the binary-star hypothesis to account for the periodic extinctions. Hut remarked that the hypothesis might be saved if the companion star, instead of passing through the asteroid belt, were to pass through the Oort cloud. That cloud is a huge shell of interstellar debris, weakly bound by the sun's gravity, in which comets are thought to form; it is named for J. H. Oort of the University of Leiden. Oort pointed out in 1950 that the comets observed in the inner solar system can be accounted for by perturbations in the orbits of some 1011 comets found between 10,000 and 100,000 astronomical units from the sun. The perturbations are caused by the random passage of stars in the neighborhood of the solar system. The comets that reach the inner solar system from this region of the Oort cloud are either trapped in relatively small solar orbits or swing so rapidly around the sun that they eventually leave the solar system.

Davis and Hut recalled that in 1981 a revised estimate of the population of comets had been published by Jack G. Hills, then of the Jet Propulsion Laboratory of the California Institute of Technology. According to Hills, comets must be far more numerous in the inner part of the Oort cloud—1,000 to 10,000 astronomical units from the sun—than they are in the region of the cloud considered by Oort. In the inner Oort cloud Hills estimated that there are roughly $10^{13}$ comets, although their total mass is less than the mass of Jupiter. The comets in the inner cloud are sufficiently well bound by the sun's gravity not to be much perturbed by a passing star, but Hills calculated that once every 500 million years the random path of a nearby star would come close enough to the sun to cause such perturbations. The perturbations would have dramatic consequences for the earth. Roughly a billion comets

would arrive in the region of the solar system inside the earth's orbit over a period of from 100,000 to a million years. Of these comets, Hills estimated, perhaps 10 to 200 would hit the earth.

Most comets are believed to consist largely of ices such as solid ammonia, solid methane and ordinary ice, but some may also have a rocky core. The impact of a rocky comet on the earth could be the source of a thin layer of clay, highly enriched in the element iridium, that has been found in geologic formations at several locations. The enriched layer of iridium was first noted by Luis W. Alvarez and his son Walter Alvarez of Berkeley and their associates; it coincides with the biological crisis of 65 million years ago, when roughly 70 percent of the families or organisms on the earth, or more than 90 percent of the species, became extinct.

Many geologists and paleontologists now accept the Alvarez hypothesis that the origin of the iridium was extraterrestrial and that the impact of the extraterrestrial object with the earth threw up enough dust to darken the earth's atmosphere for at least six months. The dust cut off much of the sunlight that normally reaches the earth's surface, inhibiting photosynthesis and causing the disruptions in the food web that led to the mass extinctions. The mechanism is similar to the one that, according to many atmospheric scientists, would give rise to a "nuclear winter" after a large-scale nuclear war.

If the cometary impacts proposed by Hills can account for the kind of extinctions suggested by the Alvarez group, Muller, Davis and Hut reason that a consistent explanation can be given for periodic extinctions. The sun's binary companion must pass close enough to the inner Oort cloud every 26 million years to cause a shower of comets in the vicinity of the earth. Following Hills's analysis, they calculate that a dwarf star passing within 30,000 astronomical units of the sun should cause an average of three or four comets to hit the earth in every orbital period of the star. The statistical variability inherent in this number can account for the fluctuations in the extinction rate that are observed in the geologic record. Moreover, the mechanism leads to the prediction that several cometary impacts can be associated with a single rise in the extinction rate. That prediction is partially confirmed by the finding that associated with the iridium layer are at least three distinct layers of microtektites. Tektites are the glassy stones believed to originate when a large object strikes the earth and splashes out melted silicate.

A few days after Muller and his colleagues had reached these conclusions Walter Alvarez suggested to Muller that periodic comet showers should be reflected in the

periodic excavation of large craters on the earth. Muller and Alvarez have analyzed 13 impact craters larger than 10 kilometers across that have been accurately dated, and they find another striking regularity: the impacts come on the average every 28.4 million years. The most recent increase in the frequency of the impacts was 13.5 million years ago, which nearly coincides with the most recent increase in extinctions. The probability that the increases are caused by random events is less than five chances out of 1,000. Muller points out that the discrepancy between the 26-million-year period and the 28.4-million-year one can be absorbed by uncertainties in the dating of the extinctions.

The most important prediction of the model is, of course, the existence of the companion star. The model makes no prediction, however, about the position of the companion in the sky. Several investigators are now searching among roughly a million stars brighter than the 12th magnitude for stars that show a small proper motion against the background of more distant stars. If the companion is found, Muller and his colleagues suggest in a footnote to their account several names: "Nemesis, after the Greek goddess who relentlessly persecutes the excessively rich, proud and powerful . . . Kali, 'the black,' after the Hindu goddess of death and destruction, who nonetheless is infinitely generous and kind to those she loves; Indra, after the Vedic god of storms and war, who uses a thunderbolt (comet?) to slay a serpent (dinosaur?), thereby releasing life-giving waters from the mountains, and finally George, after the saint who slew the dragon."

**Passage 2**

**Bureaucratic Domination**[49]

Usually the progress in death-dealing capacity achieved in the twentieth century has been described in terms of technological advances in weaponry. Too little attention has been given to the advances in social organization that allowed for the effective use of the new weapons. In order to understand how the moral barrier was crossed that made massacre in the millions possible, it is necessary to consider the importance of bureaucracy in modern political and social organization. The German sociologist Max Weber was especially cognizant of its significance.

49. A more difficult passage for analysis. Source: Richard L. Rubenstein, "Bureaucratic Domination," *The Cunning of History*, 21–31. Copyright © 1975 by Richard L. Rubenstein. By permission of Harper & Row, Publishers, Inc.

Writing in 1916, long before the Nazi party came to prominence in German politics, Weber observed:

> When fully developed, bureaucracy stands . . . under the principle of *sine ira ac studio* (without scorn and bias). *Its specific nature, which is welcomed by capitalism, develops the more perfectly the more bureaucracy is "dehumanized,"* the more completely it succeeds in eliminating from official business love, hatred, and all purely personal, irrational and emotional elements which escape calculation. This is the specific nature of bureaucracy and it is appraised as its special virtue. (Italics added.)

Weber also observed:

> The decisive reason for the advance of bureaucratic organization has always been its purely technical superiority over any other kind of organization. *The fully developed bureaucratic mechanism compares with other organizations exactly as does the machine with the nonmechanical modes of organization.*
>
> Precision, speed, unambiguity, knowledge of the files, continuity, discretion, unity, strict subordination, reduction of friction and of material and personal costs—these are raised to the optimum point in the strictly bureaucratic organization. (Italics added.)

Weber stressed "the fully developed bureaucratic mechanism." He was aware of the fact that actual bureaucracies seldom achieve the level of efficiency of the "ideal type" he had constructed. Nevertheless, he saw clearly that bureaucracy was a machine capable of effective action and was as indifferent to "all purely personal . . . elements which escape calculation" as any other machine.

In his time Karl Marx looked forward to the eventual domination of the proletariat over the body politic because of its indispensability to the working process. Max Weber was convinced that political domination would rest with whoever controlled the bureaucratic apparatus because of its indisputable superiority as an instrument for the organization of human action. But, to the best of my knowledge, even Weber never entertained the possibility that the police and civil service bureaucracies could be used as a death machine to eliminate millions who had been rendered superfluous by definition. Even Weber seems to have stopped short of foreseeing state-sponsored massacres as one of the "dehumanized" capacities of bureaucracy.

Almost from the moment they came to power, the Nazis understood the bureaucratic mechanism they controlled. When they first came to power, there were a large number of widely publicized bullying attacks on Jews throughout Germany, especially by the SA, the brown-shirted storm troopers.

However, it was soon recognized that improperly organized attacks by individuals or small groups actually hindered the process leading to administrative

massacre. The turning from sporadic bullying to systematic anonymous terror paralleled the decline in influence of the SA and the rise of Heinrich Himmler and the SS. Himmler does not seem to have been a sadist. During the war, he did not like to watch killing operations and became upset when he did. But, Himmler was the perfect bureaucrat. He did what he believed was his duty *sine ira et studio*, without bias or scorn. He recognized that the task assigned to his men, mass extermination, was humanly speaking exceedingly distasteful. On several occasions, he praised the SS for exercising an obedience so total that they overcame the feelings men would normally have when engaged in mass murder. The honor of the SS, he held, involved the ability to overcome feelings of compassion and achieve what was in fact perfect bureaucratic objectivity.

Himmler objected to private acts of sadism, but his reasons were organizational rather than moral. He understood that individual and small group outbursts diminished the efficiency of the SS. One of his most important "contributions" to the Nazi regime was to encourage the systematization of SS dominance and terror in the concentration camps. At the beginning of Hitler's rule, Himmler, as head of the SS, was subordinate to Ernst Rohm, the head of the SA, the storm troopers. Himmler's position was transformed when Hitler ordered Rohm murdered on June 30, 1934. He ceased to be a subordinate. In the aftermath of the Rohm Putsch, there was a general downgrading of the SA. SA guards were removed from the concentration camps. Their places were taken by Himmler's SS. By 1936 Himmler was appointed Reichsführer SS and Chef der Deutschen Polizei. He then dominated the entire German police apparatus.

One of the examples of Himmler's organizing ability was his involvement in the concentration camp at Dachau, which he founded in 1933. Originally, there was little to distinguish Dachau from any of the early "wild" Nazi camps. Under Himmler's guidance, Dachau became a model for the systematically managed camps of World War II. Under his direction, the sporadic terror of the "wild"camps was replaced by impersonal, systematized terror. Much of the systematization was carried out with Himmler's approval by Theodor Eicke, who became commandant at Dachau in June 1933. Eicke had spent most of his career in police administration. His organization of the camp was modern and professional. His "discretionary camp regulations," issued on October 1, 1933, provided for a strictly graded series of punishments including solitary confinement and both corporal and capital punishment for offending prisoners. When corporal punishment was inflicted, Eicke's directives provided that the punishment be carried out by several SS guards in the presence of the other guards, the prisoners and the commandant. In a report dated May 8, 1935, Eicke's successor as Dachau commandant wrote to Himmler that individual guards were "forbidden to lay hands on a prisoner or to have private conversations with them." The intent of Eicke's regulations was to eliminate all arbitrary punishment by individual guards and to replace it with impersonal, anonymous punishment. The impersonal nature of the transaction was heightened by the fact that any guard could be

called on to inflict punishment. Even if a guard was struck by a prisoner, he could not retaliate personally, at least insofar as the regulations were concerned. Like everything else at the camps, under Himmler punishment was bureaucratized and depersonalized. Bureaucratic mass murder reached its fullest development when gas chambers with a capacity for killing two thousand people at a time were installed at Auschwitz. As Hannah Arendt has observed, the very size of the chambers emphasized the complete depersonalization of the killing process.

Under Himmler, there was no objection to cruelty, provided it was disciplined and systematized. This preference was also shared by the German civil service bureaucracy. According to Hilberg, the measure that gave the civil service bureaucrats least difficulty in exterminating their victims was the imposition of a starvation diet. In a bureaucratically controlled society where every individual's ration can be strictly determined, starvation is the ideal instrument of "clean" violence. A few numbers are manipulated on paper in an office hundreds of miles away from the killing centers and millions can be condemned to a prolonged and painful death. In addition, both the death rate and the desired level of vitality of the inmates can easily be regulated by the same bureaucrats. As starvation proceeds, the victim's appearance is so drastically altered that by the time death finally releases him, he hardly seems like a human being worth saving. The very manner of death confirms the rationalization with which the killing was justified in the first place. The Nazis assigned the paranthropoid identity of a Tiermensch, a subhuman, to their victims. By the time of death that identity seemed like a self-fulfilling prophecy. Yet, the bureaucrat need lose no sleep over his victims. He never confronts the results of his distinctive kind of homicidal violence.

A crucial turning point in the transformation of outbursts of hatred into systematized violence occurred in the aftermath of the infamous Kristallnacht, the Nazi anti-Jewish riots of November 10, 1938. It is generally agreed that the riots were an unsuccessful attempt on the part of Propaganda Minister Joseph Goebbels and the SA to gain a role in the anti-Jewish process. On November 9, 1938, a young Jew, Herschel Grynzpan, assassinated Legationsrat Ernst von Rath in the German embassy in Paris. At Goebbels's instigation, SA formations set out to burn down every synagogue in Germany. Jewish stores were burned and looted and Jews were attacked throughout the country.

The SS was not informed that the operation was to take place. When Himmler heard that Goebbels had instigated a pogrom, he ordered the detention of twenty thousand Jews in concentration camps under his control and ordered the police and the SS to prevent widespread looting. According to Hilberg, Himmler dictated a file memorandum in which he expressed his distaste for the Goebbels pogrom.

In the wake of the Kristallnacht, there was widespread negative reaction against the pogrom from such leading Nazis as Goering, Economy Minister Walter Funk and the German Ambassador to the United States, Hans Dieckhoff. Goering was especially vehement in his opposition to Einzelaktionen, undisci-

plined individual actions. He expressed his opposition to pogroms and riots which led to unfavorable foreign repercussions and which permitted the mob to run loose. Goering's feelings were shared by the entire German state bureaucracy. This was simply not the way to "solve" the Jewish problem. According to Hilberg, the effect of the Nazi outrages of the thirties on the state bureaucracy was to convince the Nazi and the non-Nazi bureaucrats alike that measures against the Jews had to be taken in a rational organized way. Every step in the methodical elimination of the Jews had to be planned and carried out in a thoroughly disciplined manner. Henceforth, there would be neither emotional outbursts nor improvisations. The same meticulous care that goes into the manufacture of a Leica or a Mercedes was to be applied to the problem of eliminating the Jews. Kristallnacht was the last occasion when Jews had to fear street violence in Germany. Henceforth no brown-shirted bullies would assail them. Hilberg points out that when a decree was issued in September 1941 requiring Jews to wear the yellow star, Martin Bormann, the Chief of the Party Chancellery, issued strict orders against the molestation of the Jews as beneath the dignity of the Nazi movement. "Law and order" prevailed. There were no further state-sponsored incidents. The hoodlums were banished and the bureaucrats took over. Only then was it possible to contemplate the extermination of millions. A machinery was set up that was devoid of both love and hatred. It was only possible to overcome the moral barrier that had in the past prevented the systematic riddance of surplus populations when the project was taken out of the hands of bullies and hoodlums and delegated to bureaucrats.

When Max Weber wrote about bureaucratic domination, he did not have the Nazis in mind, nor was he proposing a prescription for slaughter. Yet, almost everything Weber wrote on the subject of bureaucracy can in retrospect be read as a description of the way the bureaucratic hierarchies of the Third Reich "solved" their Jewish problem. Furthermore, Weber's writings on bureaucracy are part of a larger attempt to understand the social and political structure and the values of modern Western civilization. Although there were bureaucracies in ancient China, Egypt, and Imperial Rome, the full development of bureaucracy in the Christian West came about as the result of the growth of a certain ethos that was in turn the outcome of fundamental tendencies in occidental religion. Bureaucracy can be understood as a structural and organizational expression of the related processes of secularization, disenchantment of the world, and rationalization. The secularization process involves the liberation of ever wider areas of human activity from religious domination. Disenchantment of the world occurs when "there are no mysterious forces that come into play, but rather that one can, in principle, master all things by calculation." Rationalization involves "the methodical attainment of a definitely given and practical end by means of an increasingly precise calculation of adequate means."

CHAPTER TEN

# *Putting It All Together: Six Steps to Understanding and Evaluating Arguments*

The previous nine chapters have presented various techniques for understanding and evaluating arguments. Chapters 2 and 3 concentrated on extracting arguments from a text. Chapter 4 outlined the task of evaluating arguments, broadly describing the criteria for soundness—validity and truth of premises—and chapter 5 focused more specifically on the concept of validity. Chapter 6 considered how we might be taken in by fallacious reasoning. Chapters 7 through 9 discussed the evaluation of specific kinds of premises: definitional premises, empirical generalizations, and theory-based statements, as well as conclusions based on convergent arguments. Now we can bring these parts together in a sequence of steps illustrated by the flowchart in Figure 10.1.

Much of the earlier discussion of particular steps in reconstructing or evaluating arguments concentrated on relatively short, stylized passages in which each sentence played a role as a premise or conclusion. We will now survey the whole six-step procedure represented on the flowchart and adapt it to understanding and evaluating arguments found in longer passages, such as essays and editorials.

***Preliminary step.*** This step directs you to read the passage in question carefully. The importance of this step should not be overlooked. One of the first things you need to determine is whether a passage does in fact put forth an argument, as opposed to describing, explaining, classifying, and so forth. Consider the context of the passage. Make use of hints such as titles or recurring themes. You can also initially determine (without fully reconstructing any arguments) whether

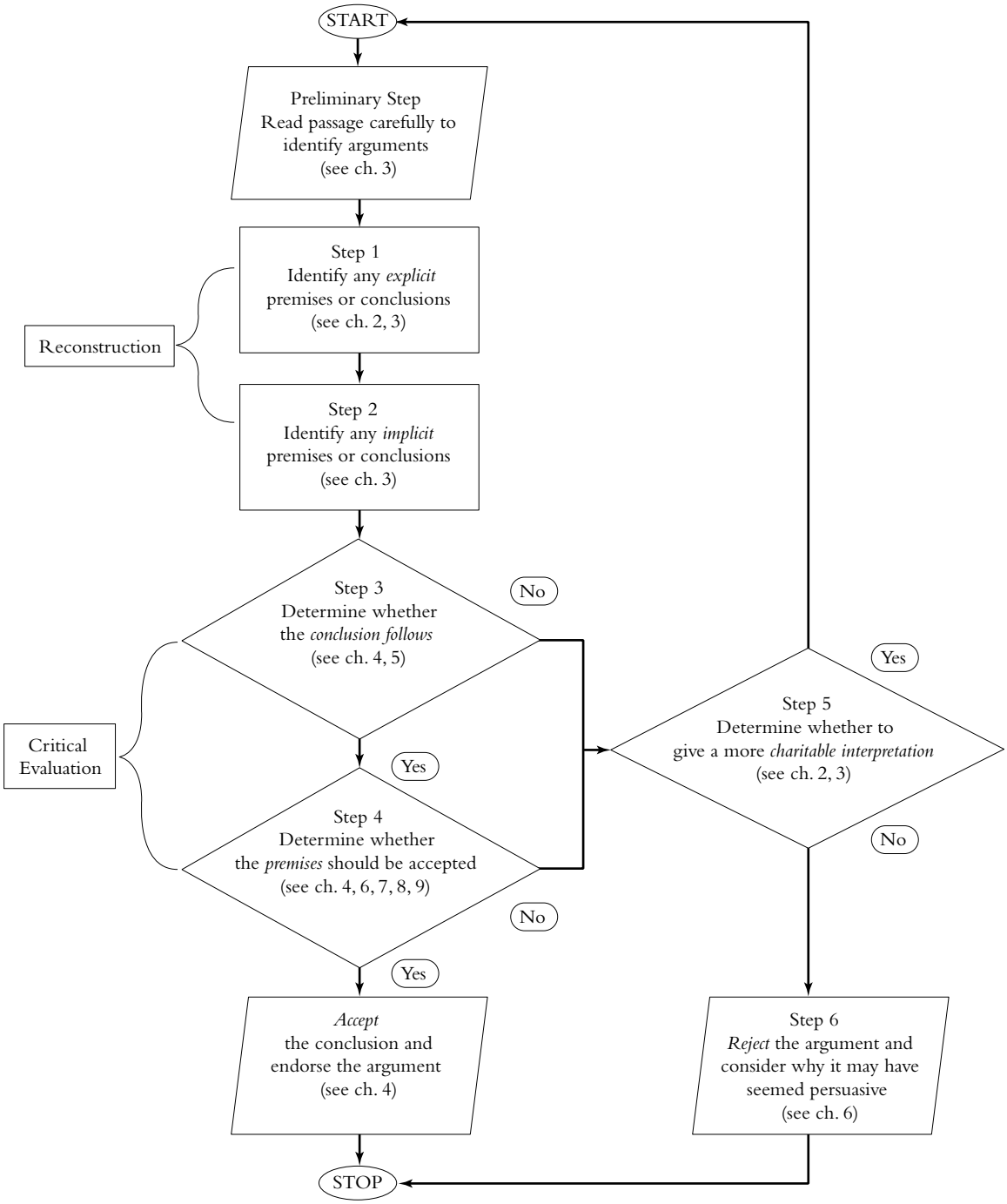


**Figure 10.1 Six steps to understanding and evaluating deductive arguments**

there is one argument or several and how different arguments are related. You might need to read a passage carefully *several times* before you understand it well enough to identify any arguments it contains and to begin reconstructing them.

***Step 1.*** You should identify any *explicit* premises or conclusions, but this doesn't mean copying sentences out of a passage exactly as they are written. More likely, you will paraphrase or restate assertions made by the passage. In actual practice, the distinction between identifying explicit and implicit premises is not as sharp as in the stylized passages we dealt with, where whole sentences *could* be copied as premises. But even if no premises can be copied word for word from the passage, some premises might be strongly suggested and easily paraphrased from what is actually written. This will allow you to begin your reconstruction.

***Step 2.*** We pointed out in chapter 3 that the step of identifying *implicit* premises typically amounts to adding any premises that are needed to make the conclusion follow (insofar as this *can* be done without radically distorting the meaning of the passage being interpreted). Adding an implicit conclusion consists of adding a conclusion that *would* follow from the interpreted premises, if the conclusion is not already stated in the passage. This will lead to a full reconstruction.

***Step 3.*** Given what we just said about step 2, determining whether the conclusion follows will often be carried out in the process of adding implicit premises or an implicit conclusion. The premises and conclusion of the argument might have been stated so explicitly, however, that step 2 is unnecessary, and a negative answer to the question in step 3 (Does the conclusion follow?) might be unavoidable. Or (as happens more frequently), the argument might contain an unclear expression that occurs more than once. If so, you will probably make several quick loops through steps 3, 4, and 5, and back through 1 and 2, to determine whether a single meaning that makes all the premises acceptable can be assigned to this expression (see chapter 7).

***Step 4.*** Determining whether the premises should be accepted or rejected was discussed in general in chapter 4. More detailed techniques for evaluating additional kinds of premises—particularly definitional premises and empirical generalizations—as well as convergent arguments and scientific theories were investigated in chapters 7, 8, and 9. If you decide that the premises should be accepted, then you are done with your evaluation. If you decide to reject the argument, you move to a reassessment stage at step 5. What do you do if you can neither clearly accept nor reject the argument? You have two options again. You might move to step 5 and try another interpretation, or, especially if you have tried various interpretations, you might quit and decide to remain uncommitted to the conclusion until a better argument is given.

***Step 5.*** If you find that the conclusion of an argument does not follow or the premises are unacceptable, the flowchart directs you to consider giving a more charitable interpretation of the argument. This procedure is in keeping with the rationale for critical reasoning that has been promoted throughout this book: being presented with an argument should be taken as an opportunity to deter-

mine what is reasonable to believe, not as a contest in which the object is to defeat the person who has presented the argument.

If an argument can be interpreted in such a way that the conclusion follows and the premises are acceptable, then the flowchart calls for the conclusion to be accepted. If, on the other hand, there is no reasonable way of interpreting the argument so that it passes these tests, the argument should be rejected.

***Step 6.*** However, if an argument is rejected, the flowchart calls for the additional step of considering why the argument may have seemed persuasive. This is a particularly helpful step in a direct exchange with someone who has offered an argument or with an audience that might have been persuaded by it. It is much more likely that you will be able to sell your negative appraisal of the argument if you can explain why the arguer or audience was tempted to accept it in the first place. For this purpose, the discussion of fallacies in chapter 6 should be helpful, since that analysis was aimed at explaining why people tend to be persuaded by certain kinds of bad arguments. Step 6 can also serve as an occasion to suggest what direction might be taken to improve the argument being examined. Often some core of reasonableness that the presenter of the argument was not able to adequately express lies behind the argument being offered. Perhaps even the Principle of Charitable Interpretation won't permit the argument to be revised radically enough to capture this reasonableness. But in applying the six-step procedure you might have developed some ideas about how a different but related argument could be constructed that *would* be acceptable.

## A Sample Application of the Six-Step Procedure

It may be helpful to apply the entire six-step procedure to an argument found in a newspaper editorial. The following discussion is much more thorough than would be appropriate to present in, say, a critical essay. It explains the steps you could go through in your mind in preparing to write about or discuss the argument.

Suppose you came across the editorial included as passage 10.1 and decided to consider it carefully to understand it clearly and evaluate its main arguments. How could the six-step procedure be used to carry out this task?

The way you would proceed depends in part on the particular purpose you had in analyzing the editorial. You might intend to write a reply, discuss the editorial with someone interested in the topic of prayer in the public schools, or simply figure out whether to accept the point of view being advanced by the writer. For many purposes, the following analysis is probably more detailed than you would need to go through, but the steps you would take would be essentially the same. An example of a shorter, more tightly organized discussion that could be presented in a critical essay is given later in this chapter.

## Preliminary Step: Read Passage Carefully to Identify Arguments

Even though the main points of this editorial are reasonably clear, a careful reading will lead you to see beyond some surface features that might mislead the casual reader.

Passage 10.1

### A Selfish Way of Looking at the Law[1]

*1* In Georgia, a teacher of American government chose a poor way to deal with a law with which he disagreed. He broke it. He went right on teaching while other members of the faculty were observing a moment of silence, as required by the new law.

*2* The teacher was suspended with pay. He said he planned to sue the school system, saying the suspension violated his First Amendment rights.

*3* Yes, the teacher has every right to disagree with the law. Reasonable people differ over the propriety of requiring prayer, moments of silence and similar observances in public schools. But what a wonderful opportunity he had to teach his students about the responsibilities of a citizen to obey a disagreeable law while working within the system to change it. And how thoroughly he blew that opportunity.

*4* Certainly breaking a law is one way to protest its existence. Civil disobedience has a long history in the movements to abolish slavery, win civil rights and end unpopular wars. Civil disobedience is one way to get the question before the court. It's also a way to stir up public support for one's position.

*5* But if the teaching of American government is worthwhile, it shouldn't convey the impression that civil disobedience is the first line of attack. There should be lessons on majority rule and how it affects the making and changing of laws. The students should look at the role of political parties and special interest groups in building a consensus for change. There should be attention to the option of running for office or supporting candidates who are committed to changing the law. And finally, young people need to know that they can't always have their way. Some laws must be tolerated even though a few people might disagree with them.

*6* Those approaches may lack the drama of "taking a stand." But when a dramatic, attention getting gesture is depicted as superior to working within the system and building a consensus a harmful message is delivered. This teacher's example said it's permissible to pick and choose among the laws obeying or disobeying as one sees sees fit. If everyone followed that selfish notion, the result would be chaos.

1. © 1994 by the *Omaha World-Herald*. Reprinted by permission.

The first two paragraphs set out the case at issue. A Georgia schoolteacher intentionally disobeyed a new law requiring a "moment of silence" at the beginning of the school day, was suspended from teaching, and planned to appeal his suspension on constitutional grounds. The third paragraph indicates that this case involves freedom of religion, in particular "the propriety of requiring prayer, moments of silence and similar observances in public schools." It is useful but not essential to understanding the passage to realize that the teacher's action has taken place against a background of Supreme Court decisions apparently prohibiting prayer in the public schools. The Georgia law could be seen as an attempt to get around these decisions.

Paragraph 3 sets up an opposition between the teacher's action, which it later characterizes as "civil disobedience," and the alternative of working within the system. The final sentence—which says he "blew" the opportunity to work within the system—indicates the conclusion of the argument in the editorial: *the teacher should have worked within the system to change the law.*

Paragraph 4 summarizes some of the reasons why a person might want to carry out civil disobedience, and paragraph 5 sets out the alternative open to a teacher in criticizing the law without breaking it in an act of civil disobedience.

Finally, paragraph 6 argues that the teacher shouldn't have committed civil disobedience in this case. It suggests that picking and choosing which laws to obey would result in chaos.

A careful reading leads us to an initial interpretation of the main argument along the following lines. The central conclusion is that the teacher should have worked within the legal system to change the laws. Paragraphs 3 to 5 set out the alternatives and suggest that civil disobedience should not have been carried out in this case. The final paragraph provides a reason for holding that an act of civil disobedience should not have occurred; namely, that such civil disobedience would result in chaos.

**Step 1: Begin Reconstruction by Identifying Any Explicit Premises or Conclusions in Overall Argument** As we discussed in chapter 3, the distinction between explicit and implicit premises and conclusions is not sharp when you are reconstructing an argument from a complex prose passage. Nowhere in the essay is it explicitly stated that "the teacher should have worked within the legal system to change the law." Rather, evaluative comments such as "he blew that opportunity" or the title "A Selfish Way of Looking at the Law" suggest that the editorial is arguing in favor of working within the system. Even though no "either-or sentence" is given, the two alternatives being considered—civil disobedience and working within the system—are fairly explicit in the text. This suggests the premise

(1) *Either the teacher should have committed civil disobedience or he should have worked within the legal system to change the law.*

**Paragraphs Containing Main Argument 1**

*3* Yes, the teacher has every right to disagree with the law. Reasonable people differ over the propriety of requiring prayer, moments of silence and similar observances in public schools. But what a wonderful opportunity he had to teach his students about the responsibilities of a citizen to obey a disagreeable law while working within the system to change it. And how thoroughly he blew that opportunity.

*4* Certainly breaking a law is one way to protest its existence. . . . But if the teaching of American government is worthwhile, it shouldn't con-

*5* vey the impression that civil disobedience is the first line of attack.

**Step 2: Complete Reconstruction by Adding an Implicit Premise to the Main Argument** On reviewing the premise as stated above and the conclusion we identified in the preliminary step, we can recognize that we have two of the three statements needed for a disjunctive argument fitting the pattern:

*(i) A or B.*

***(missing)*** *(ii) Not A.*

*∴ B.*

To interpret the argument in this form, we would need to add as an implicit premise: *The teacher should not have committed civil disobedience*.

***First Interpretation of Passage 10.1***

***(suggested by paragraphs 3–5)*** *(i) Either the teacher should have committed civil disobedience or he should have worked within the legal system to change the law.*

*(ii) The teacher should not have committed civil disobedience.*

*∴ The teacher should have worked within the legal system to change the law.*

Premise (ii) in this reconstruction is itself the conclusion of a supporting argument.

**Paragraph Containing Supporting Argument**

*6* But when a dramatic, attention getting gesture is depicted as superior to working within the system and building a consensus a harmful message is delivered. This teacher's example said it's permissible to pick and choose among the laws, obeying or disobeying as one sees fit. If everyone followed that selfish notion, the result would be chaos.

**Applying Steps 1 and 2 to the Supporting Argument** The argument in paragraph 6 supports the conclusion that *The teacher should not have committed civil disobedience* (which was the implicit premise of the main argument). And we have already identified the explicit premise that *if it is permissible for everyone to pick and choose among laws, then chaos would result*. Implicit in the argument is the assumption that *chaos shouldn't occur* and a link between the teacher's civil disobedience and the notion that it is permissible for everyone to pick and choose among laws.[2]

***Supporting Argument***

***(implicit)*** *(1) If the teacher should have committed civil disobedience, then it is permissible for him to pick and choose among laws.*

***(implicit)*** *(2) If it is permissible for him to pick and choose among laws, then it is permissible for everyone to do so.*

***(paragraph 6)*** *(3) If it is permissible for everyone to do so, then chaos would occur.*

***(implicit)*** *(4) Chaos shouldn't occur.*

*∴ The teacher should not have committed civil disobedience.*

**Applying Steps 3, 4, and 5 to the Arguments** As will often be the case, we have interpreted these arguments in such a way that the implicit premises we add permit the conclusions to follow from the premises. Indeed, we could have combined the main and supporting arguments into one continuous argument, as we discussed in chapter 3.

***Arguments Combined into One Continuous Argument***

***(suggested by paragraphs 3–5)*** *(1) Either the teacher should have committed civil disobedience or he should have worked within the legal system to change the law.*

***(implicit)*** *(2) If the teacher should have committed civil disobedience, then it is permissible for him to pick and choose among laws.*

***(implicit)*** *(3) If it is permissible for him to pick and choose among laws, then it is permissible for everyone to do so.*

2. The argument can be interpreted as an extended version of *modus tollens* that combines it with a chain argument, having the form:

*(1) If A, then B.*
*(2) If B, then C.*
*(3) If C, then D.*
*(4) Not D.*
*∴ Not A.*

***(paragraph 6)*** *(4) If it is permissible for everyone to do so, then chaos would occur.*

***(implicit)*** *(5) Chaos shouldn't occur.*

---

∴ *The teacher should have worked within the legal system to change the law.*

The two fairly explicit premises—1 and 4 in the continuous version of the argument—appear quite acceptable. As premise 4 suggests, if everyone were to pick and choose which laws to follow (for example, which traffic laws), then chaos would likely follow. And given that the teacher was going to respond to the law, civil disobedience or working within the system appear to be the two alternatives, as suggested in premise 1. We should note, however, that a supporter of the Georgia law would maintain that the teacher had a third course of action open, namely, following the law. Hence, the argument might contain a false dilemma fallacy.

What about the implicit premises? Are they acceptable? Premise 5 is straightforward. It is easy to agree that social chaos shouldn't occur. Premise 3 is less easy to assess. But it is plausible to maintain that if the teacher can be permitted to pick and choose which laws to obey solely on the basis of his judgment, then it must be permissible for anyone to do so.[3] There is nothing special about this particular teacher.

We are left to assess premise 2: *If the teacher should have committed civil disobedience, then it is permissible for him to pick and choose among laws.* This premise can be criticized by noting that the civil disobedience in this case is limited to a controversial law that is of dubious constitutionality. Furthermore, breaking of the law does not do direct, serious harm. We can hold that civil disobedience in such cases (those involving controversial laws of dubious constitutionality in which breaking of the law does no serious harm) is justified (and permitted) without holding that the teacher (or anyone else) is permitted to break all laws. Laws against murder, driving on the wrong side of the road, and even tax evasion do not involve controversial laws of dubious constitutionality, and in the case of murder and reckless driving breaking them would likely cause serious harm.

These considerations give us grounds for rejecting premise 2 of the continuous version of the argument at step 4 in the flowchart. This leads us to consider according to step 5 whether a more charitable interpretation is possible. The title and choice of words in paragraph 6 suggest another version of the argument:

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3. This premise embodies what is sometimes called the *Generalization Principle* in ethics: roughly, if it is right for someone to do something in a situation, it is also right for similar people to do similar things in similar situations.

***A Second Version of the Argument in Passage 10.1***

***(suggested by paragraphs 3–5)*** *(1) Either the teacher should have committed civil disobedience or he should have worked within the legal system to change the law.*

***(implicit)*** *(2) If the teacher should have committed civil disobedience, then it is permissible to act selfishly.*

***(implicit)*** *(3) It isn't permissible to act selfishly.*

*∴ The teacher should have worked within the legal system to change the law.*

Even if we accept premises 1 and 3 there are problems with premise 2. Exactly why is the teacher's act selfish? Many would hold that he is acting altruistically for what he perceives as a larger constitutional principle. Indeed, his suspension presumably caused him some amount of harm. It is true that he did what he wanted to do and believed was right to do. But this is not enough to make the act *selfish*. If anything, this version of the argument is less charitable than the first. This interpretation fails as well.

A third interpretation, which focuses on the issue of whether civil disobedience should be the first line of attack, is also suggested, particularly in paragraph 5. This interpretation of the argument acknowledges that civil disobedience might ultimately be used, but not until a person has exhausted other avenues. It notes that teachers are especially well positioned to work for change of a law they believe is bad within the system.

***A Third Version of the Argument in Passage 10.1***

***(suggested by paragraph 5)*** *(1) If a person can work within the system to change a bad law, then that person should not commit civil disobedience (as the first line of attack).*

***(suggested by paragraph 5)*** *(2) The teacher can work within the system to change a bad law.*

*∴ The teacher should not commit civil disobedience (as the first line of attack).*

As in the case of the first two interpretations, this version of the main argument has been constructed so that it is valid. It is an instance of *modus ponens*. What about the premises?

Premise 2 is certainly plausible. As paragraph 5 indicates, the teacher can work toward changing the law by teaching students lessons about democracy and about their options in working toward a change of state law within it. We can criticize premise 1 by pointing out first that even if a person can work toward something in a certain way, that doesn't mean that there is much chance of success using this route. If there is another more effective alternative, perhaps this should be carried out instead. For example, it might be the case that *if you win the lottery, you need not look for a job.* It does not follow that *if you try to win—that is, play the lottery—you need not look for a job*. So it can be true that *you play the lottery*, but false that *you*

*need not look for a job*. Perhaps you should do both. Similarly, teaching a few students, even galvanizing them to act, might possibly be instrumental in changing state law, but like the lottery the prospects are not very good. Just as looking for a job is a viable alternative to trying to win the lottery, civil disobedience might be a viable alternative to working within the system as a teacher.

Second, even if the teacher could be successful in overturning Georgia state law by working within the system, there is the larger question about similar laws that might be passed in other states. The teacher is described as interested in the First Amendment. He is challenging the constitutionality of the law. If the Georgia law is overturned by the federal district court or the U.S. Supreme Court, then his action would have an effect not just in Georgia but in other states as well. To raise such a constitutional issue it is necessary to have standing. By breaking the law, the Georgia teacher is in a position to appeal its constitutionality. Seen in this light, his action is actually necessary to achieving his larger aim. So, the first premise is false on these grounds as well. Even though he could (successfully) work within the system to change the Georgia law, given his larger constitutional aim he should also commit civil disobedience (as the first line of attack).

**Applying Step 6 to the Arguments** To conclude the application of the flowchart to the three interpretations of the editorial, we should ask why they might have seemed persuasive. In addition to the false dilemma in premise 1 that we mentioned earlier, two premises from interpretation 1 can be seen as committing the slippery slope fallacy:

*(3) If it is permissible for him to pick and choose among laws, then it is permissible for everyone.*

*(4) If it is permissible for everyone to do so, then chaos would occur.*

These statements suggest that his act of disobedience with respect to a newly passed law of questionable constitutionality might somehow encourage widespread law-breaking, which would then lead to chaos. A single act of civil disobedience is unlikely to produce this effect.

The second argument depends on the premises

*(2) If the teacher should have committed civil disobedience, then it is permissible to act selfishly.*

*(3) It isn't permissible to act selfishly.*

They contain an equivocation involving the concept of a selfish act. Premise 3 depends on the common interpretation of a selfish act as one that is done to benefit oneself at the expense of others. Premise 2 seems to assume that any act that occurs for *one's own reasons* is selfish.

Similarly, argument 3 might seem plausible because of an equivocation as well. The term *system* is used differently in the two premises.

*(1) If a person can work within the system to change a bad law, then that person should not commit civil disobedience (as the first line of attack).*

*(2) The teacher can work within the system to change a bad law.*

In premise 2 the "system" is the system of state laws and the political action that might change them. But as we pointed out in our analysis, the truth of premise 1 is plausible only if the "system" includes the larger system of laws and their constitutional interpretation.

If you are discussing this editorial with someone who accepted the arguments it contained, you might be more effective in promoting your negative appraisal if you helped the person understand how these arguments could have misled him or her. The discussion above suggests some possibilities.

## A Second Sample Application of the Six-Step Procedure

A second example, passage 10.2 starting below, will help you understand the six-step procedure better.

### Preliminary Step: Read Passage Carefully to Identify Arguments

The main points in this second editorial are reasonably clear. Although the beginning and ending attempt to defend a political economist for some remarks he made in a speech, the body develops the writer's own arguments against the proposal of comparable worth and goes beyond assessing whether the economist's remarks were appropriate.

Passage 10.2

**Pitfalls in Comparable Worth**[4]

*1* Some people in a largely female audience objected the other day when . . . economist William Niskanen criticized . . . the concept known as "comparable worth" or "comparable pay." Niskanen called the idea "a truly crazy proposal."

Perhaps that wasn't the most diplomatic way Niskanen could have selected for disagreeing with a concept that the National Organization for Women, among other groups and individuals, insists is a matter of justice. *2*

4. © 1984 by the *Omaha World-Herald*. Reprinted by permission.

But he was right to criticize the idea. . . . There is no good argument for an employer to pay less to women for doing the same job men do simply because they are women. That kind of discrimination is wrong.

*3*

But that isn't the issue here. The comparable worth concept says men and women in different occupations should receive the same wages if their jobs are "comparable." Advocates of the idea say such a plan is necessary to address the fact that women with full-time jobs are, on the average, paid less than men with full-time jobs.

*4*

Who decides what is comparable? A study by the State University of New York suggested that a registered nurse was comparable in responsibility and education to a vocational education teacher. Another study ranked dining-hall directors with auto parts handlers and highway maintenance workers with clerk-typists.

*5*

Such judgments can depend on criteria that are so arbitrary that they are almost worthless. Some people might make a case for the idea that nurses have more responsibility than vocational education teachers and consequently should be paid more. Or that dining-hall directors ought to be paid more than auto parts handlers.

*6*

A National Academy of Sciences committee conducted a comparability study based on required skills, level of experience, responsibility, effort, working conditions and other factors. The committee said there are no absolute standards for judging the worth of all jobs.

*7*

Such efforts raise questions of fairness. How much weight should be given to each of the factors? How about such difficult-to-measure factors as number of interruptions in an employee's working day? Or the degree of danger involved in the job?

*8*

Even if it were possible to devise a fair system of determining comparability, it would not be a logical basis for determining compensation.

*9*

The imposition of a comparable pay plan for public employees could place a considerable burden on taxpayers. Obviously, nobody's pay would be reduced. Equalizing would mean raising.

*10*

A comparable worth system also could disrupt market forces that encourage people to enter occupations where more workers are needed and discourage people from entering fields where there is a surplus of workers.

*11*

When there is a shortage of nurses, employers ought to be able to offer higher nursing salaries without causing nearby high schools to have to offer higher salaries for vocational education teachers.

*12*

Niskanen might have been undiplomatic in calling comparable worth a "truly crazy proposal." But the term "voodoo economics" has already been used.

*13*

Paragraph 4 specifies that it is not the issue of men and women getting the same pay for the same jobs that is being discussed, but rather the issue of whether "men and women . . . should receive the same wages if their jobs are 'comparable.'" Clearly, the writer is opposed to such a policy.

What does a careful reading lead us to take as the main arguments of this essay? A major conclusion being supported is that a system of comparable worth should not be implemented. Paragraphs 5 through 8 give one set of related reasons for this conclusion, and paragraphs 10 through 12 give another set of reasons. We can interpret these as two arguments with the same conclusion.

**Step 1: Begin Reconstruction by Identifying Any Explicit Premises or Conclusions** As we discussed in chapter 3, the distinction between explicit and implicit premises and conclusions is not sharp when you are reconstructing an argument from a complex prose passage. Nowhere in the essay is it explicitly stated that "a system of comparable worth should not be implemented." But the statements that the economist "was right to criticize the idea" (paragraph 3) and "even if it were possible to devise a fair system of determining comparability, it would not be a logical basis for determining compensation" (paragraph 9) leave no room for doubt that this is what the writer intends.

**Paragraphs Containing the First Argument in Passage 10.2**

*5* Who decides what is comparable? A study by the State University of New York suggested that a registered nurse was comparable in responsibility and education to a vocational education teacher. Another study ranked dining-hall directors with auto parts handlers and highway maintenance workers with clerk-typists.

*6* Such judgments can depend on criteria that are so arbitrary that they are almost worthless. Some people might make a case for the idea that nurses have more responsibility than vocational education teachers and consequently should be paid more. Or that dining-hall directors ought to be paid more than auto parts handlers.

*7* A National Academy of Sciences committee conducted a comparability study based on required skills, level of experience, responsibility, effort, working conditions and other factors. The committee said there are no absolute standards for judging the worth of all jobs.

*8* Such efforts raise questions of fairness. How much weight should be given to each of the factors? How about such difficult-to-measure factors as number of interruptions in an employee's working day? Or the degree of danger involved in the job?

*9* Even if it were possible to devise a fair system of determining comparability, it would not be a logical basis for determining compensation.

Picking out premises in the first argument (paragraphs 5 through 8) demands much more interpretation. Paragraphs 5 through 7 assert that different people would judge comparable worth differently, that criteria of comparable worth are arbitrary, and that there are no absolute standards of comparable worth. The way the writer moves from one of these assertions to the next, using the same kind of examples in support of each, would suggest that he takes all three to be roughly equivalent. When paragraph 8 moves to the claim that the (unsuccessful) efforts to judge comparable worth objectively "raise questions of fairness," we are led to take two of the premises of the first argument to be:

*(1) There are no objective criteria for determining comparable worth.*

*(2) If there are no objective criteria for determining comparable worth, then comparable worth can't be determined fairly.*

When the writer states in paragraph 9 that "even if it were possible to devise a fair system of determining comparable worth, it would not be a logical basis for determining compensation," he seems to suggest that the impossibility of determining comparable worth fairly is one consideration that would establish that comparable worth shouldn't be implemented, and now he is going to set forth another one. On this interpretation, we assume that the writer has already completed his first argument against comparable worth.

**Step 2: Adding an Implicit Premise to the First Argument** On reviewing the premises stated above, we can see that we need an implicit premise in order to reach the intended conclusion.

***Argument 1 (suggested by paragraphs 5–8)***

*(1) There are no objective criteria for determining comparable worth.*

*(2) If there are no objective criteria for determining comparable worth, then comparable worth can't be determined fairly.*

***(implicit)***

*(3) If comparable worth can't be determined fairly, then a system of comparable worth should not be implemented.*

---

∴ *A system of comparable worth should not be implemented.*

**Applying Steps 1 and 2 to the Second Argument in Passage 10.2** The second argument is more straightforward. The writer raises two considerations against implementing comparable worth: (1) such a practice for public employees would be burdensome to taxpayers (paragraph 10), and (2) it would disrupt market forces (paragraph 11).

**Paragraphs Containing the Second Argument in Passage 10.2**

*10* The imposition of a comparable pay plan for public employees could place a considerable burden on taxpayers. Obviously, nobody's pay would be reduced. Equalizing would mean raising.

*11* A comparable worth system also could disrupt market forces that encourage people to enter occupations where more workers are needed and discourage people from entering fields where there is a surplus of workers.

*12* When there is a shortage of nurses, employers ought to be able to offer higher nursing salaries without causing nearby high schools to have to offer higher salaries for vocational education teachers.

The reasoning for the second consideration is interesting enough to be detailed as part of the argument: under a system of comparable worth, if offering higher salaries were necessary to counteract a shortage of workers in one field, then higher salaries would also have to be offered in comparable fields. Combining these premises with the obvious implicit premises and keeping the same conclusion as in argument 1, we would have:

***Argument 2***

***(paraphrase of paragraph 10)*** *(1) A system of comparable worth for public employees would be burdensome to taxpayers.*

***(paraphrase of paragraph 11)*** *(2) If a system of comparable worth were implemented, then higher salaries offered to attract workers to one field would have to be matched by higher salaries in comparable fields.*

***(implicit)*** *(3) If a policy would be burdensome to taxpayers and would have the consequences for the market described in premise 2, then it shouldn't be implemented.*

---

*∴ A system of comparable worth shouldn't be implemented.*

**Applying Steps 3, 4, and 5 to the First Argument in Passage 10.2** As will often be the case, we have interpreted these arguments in such a way that the implicit premises we add permit the conclusions to follow from the premises. That is, the conclusions will follow unless there is a shift in the meaning of a word or expression. Noting this for our reconstruction, we can move to step 4. If in our determination of whether to accept the premises we find that their acceptability depends on the meaning of an unclear expression, we can then determine whether there are any shifts in meaning from one premise to another.

Premise 1 states that there are no objective criteria for determining comparable worth. As we noted earlier, the writer seems to interpret this in either of two ways: (1) criteria of comparable worth are arbitrary, or (2) different people would judge comparable worth differently. But it must be remembered that however we interpret this premise, we must use the same interpretation when we consider (in premise 2) whether comparable worth can be determined fairly if there are no objective criteria, if the criteria are arbitrary, or if different people would judge it differently.

With this in mind, we can reject the second interpretation of premise 1 as simply stating that different people would judge comparable worth differently; there are, in fact, many things people would judge differently but that could nevertheless be judged fairly. Different people would judge criminal guilt or innocence differently. They would judge whether a person deserved a promotion differently. They would judge the quality of a dive differently. If we maintain that these are also things that can't be judged fairly, we must remember that in premise 3 the failure to be able to judge something fairly will be taken as a reason against implementing it. Should the practices of holding criminal trials, promoting employees, and holding diving contests also be abandoned?

What we are doing at this point is following the flowchart from step 4 to step 5 and back through steps 1, 2, and 3. This is the dialogue process of interpreting and evaluating that we referred to in chapter 7. We determined that if a premise is assigned a certain meaning, this will force another premise to be false (or else the argument will become an equivocation and the conclusion will not follow). So we attempted a more charitable interpretation and determined whether this would make the premises acceptable and still allow the conclusion to follow.

In argument 1, we still need to consider the first of the two interpretations of premise 1—that is, we could interpret the claim that there are no objective criteria to mean that all criteria are arbitrary: either no defensible rationale could be given for using one set of criteria rather than another, or after some set of criteria was decided on, it would yield different results depending on who applied the criteria. The latter would run into the same difficulties as did "different people would judge comparable worth differently." What about the former?

Could a defensible rationale be given for using one set of criteria for comparable worth rather than another? In determining this we come to some substantive issues that probably lie at the basis of the comparable worth controversy. One approach to the worth or value of a worker would simply be to point to the market for a worker's skill as a gauge of its value. How much people are willing to pay for your work is a measure of how valuable it is to them. But on this interpretation, there can be no problem of comparable worth because (if the market is allowed to operate freely) each person will get exactly what she or he is worth.

Others, however, will estimate the worth of a worker in terms of some notion of what is deserved. Such factors as effort, stress on the job, or education required for the position might be seen as indicating that a person deserves a certain wage, regardless of the market demand for his or her work.

No doubt the proponents on any side of this issue could give a defense of their criteria. But it is likely that none of them will be able to convince all, or even very many, of their opponents. In this sense we can probably accept the claim that there are no objective criteria for determining comparable worth.

Again, we must assign this same interpretation to premise 2 when we ask whether comparable worth can be determined fairly if there are no objective criteria. What if certain criteria are arrived at (by vote, say), even though no one agrees to all of them? If these criteria are applied as uniformly as possible from case to case, then won't comparable worth have been determined fairly? The determination may not satisfy everyone's criteria of accuracy, but would the determination be unfair? It may be like the diving example, in which different people might think different factors should be taken into account in judging a dive. But once a set of criteria is decided on (again by vote), it might well be claimed that the judging could be done fairly.

The implicit premise—if comparable worth can't be determined fairly, then it shouldn't be implemented—would seem to depend on how unfair the determination of comparable worth was and how grievous the injustice was that it tried to correct. If it were necessary to spend tax money obtained by a system that has some minimal unfairness in it in order to provide the right to vote to people who had been unjustly excluded from voting, then this would surely not be an overriding consideration against providing this right. The extent to which differences in wages between women and men have been the result of past injustice and the gravity of the injustice would have to be determined.

We have gone to considerable lengths to interpret and reinterpret the premises of the first argument so they will be acceptable and the conclusion will follow, but with little success. The point at which we give up this procedure (that is, give a negative answer to step 5) is somewhat arbitrary. Realistically, it depends on how much time and energy we are willing to devote to the argument.

Perhaps it would be adequate for our purposes to suggest a direction that might be taken if the process of reinterpretation were to be carried further. The difficulties raised by the writer with arriving at criteria for judging comparable worth do carry some weight as a consideration against implementing a policy of comparable worth. Perhaps the writer did not intend that this consideration alone would be compelling; but that in combination with the problems raised by the second argument, we have adequate reason to reject the idea of comparable worth. A possible direction for further revision of the argument could then be to combine argument 1 with argument 2.

**Applying Step 6 to the First Argument in Passage 10.2** To conclude the application of the flowchart to argument 1, we must ask why this argument might have seemed persuasive. The argument doesn't straightforwardly commit any of the common fallacies (unless it is taken as an equivocation). There

may be an illegitimate appeal to authority in citing a National Academy of Sciences Committee as having determined that there are no absolute standards for judging comparable worth. (It is questionable whether this issue could be settled by any of the sciences.)

It is undeniable that different people will interpret comparable worth in radically different ways. And it is tempting to conclude from this that comparable worth should not be implemented. Why is this? Perhaps it seems unreasonable to enact a public policy when there is little consensus regarding the criteria on which it would be based. Perhaps the fact that there is little agreement on criteria raises the possibility that some really inappropriate criteria—ones that should have nothing to do with comparable worth—would be implemented. If this were the case, then it would really seem unjust to implement a comparable worth policy that included inappropriate criteria.

It is likely that the writer is beset by fears such as these, which are not clearly articulated, and that his argument seemed persuasive to him because it captured some of his reasoning and led to the desired conclusion—that comparable worth should not be implemented. It must be remembered that even if the particular argument he presented is not judged to warrant its conclusion, that doesn't mean the conclusion is false. Finally, as we suggested earlier, it could be that the first argument was intended only as one consideration against comparable worth, with the major consideration set forth in the second argument in passage 10.2.

## Exercise 10.1 Applying the Six-Step Procedure

1. Carry out the remainder of the six-step procedure in evaluating the second argument from "Pitfalls in Comparable Worth" (passage 10.2).
2. In chapter 3 you applied the first two steps of the procedure to the passages in Exercise 3.3. Apply the remainder of the six-step procedure to the arguments from those passages.
3. Apply the six-step procedure to the following longer passages. (i) Supply appropriate reconstructions and sketch criticisms. (ii) (optional) Weave your presentation of the central arguments in the passages and your criticisms into short essays.

   a. Full article by Ellen Goodman on following pages.

**Gender Tests May Not Be Worth Risk of Misuse**[5]

The woman beside me pats her rounded stomach and rolls her eyes to the ceiling, exclaiming, "Is she ever active today!" The "she" in this action won't be born until March. But my pregnant companion already knows the gender of this gestation.

I have grown accustomed to the attachment of a pronoun to a fetus by now. Most women I know of her age and anxiety level have had "the test" and gotten the results.

Over the past two decades, through amniocentesis and then CVS and sonograms, a generation of parents has received a prenatal exam, a genetic checkup on their offspring. They have all been given new information and sometimes new, unhappy choices.

But the "she" playing soccer in the neighboring uterus is a healthy baby. And the woman is more than pleased with both of those pieces of knowledge.

What if she were not? What if she and her husband had regarded the sex of this child as a devastating disappointment?

I wonder about this because, in the news, doctors report success on the road to developing a simple blood test on pregnant women to determine the sex of the fetus. The geneticists are excited because such a test could allow safer, widespread testing. It could help those worried about gender-linked inherited diseases.

But this test may increase the possibility of abortion for sex selection by those who regard gender—the wrong gender—as a genetic flaw.

The repugnance to abortion-by-gender runs deep in our culture. Both pro-choice supporters who believe that abortion is a serious decision and pro-life supporters who believe it is an immoral decision unite in opposing sex selection as the most frivolous or sexist of motives.

It is the rare person who defends it on the grounds of population control or pure parental choice. It is a rarer American who chooses it. Indeed, the only countries in which sex selection occurs in discernible numbers have been those such as India or Korea where daughters have long been unwanted. It is almost always female fetuses that are aborted. But gender testing and the capacity for gender choosing—before and after conception—is an ethical issue in this country, too. This is the first, but hardly the last time, that the new technology will be available to produce designer babies. Today, genetic testing is valued in America because it leads to the diagnosis of diseases that cause

5. Ellen Goodman, *New York Times.* © 1992 by The Boston Globe Newspaper Company/Washington Post Writers Group. Reprinted with permission.

pain and death and disability. Eventually it may lead to their cure. But in the future, we also are likely to have access to much more information about genes than we need medically. We may be able to identify the gene for height, hair color, eye color, perhaps even athletic ability or intelligence.

There will always be parents who, out of ego, or some perverse view of children as a perfect product, want to pick and choose genes according to a master plan. Should society encourage or allow that? Must doctors perform tests and turn over information to patients to do with as they will?

John Fletcher, an ethicist at the University of Virginia, suggests a line to be drawn around our right to know. "Any kind of genetic knowledge that isn't related to a genuine disease," he says, "is on the other side of the line."

Because gender, like hair color, is not a disease, he believes that the medical profession can refuse testing and disclosing for two reasons. To prevent abortion-by-gender and, in a wider moral context, to keep genetic research on the right track.

Americans haven't yet learned how to say "no" to knowledge. Doctors may feel uncomfortable, even paternalistic, withholding information from people about their own bodies, genes, fetuses. Pennsylvania has banned abortion for sex selection in a bill that goes into effect this month. Such a ban is not only impossible to enforce but says nothing about the future dilemmas of reproductive knowledge.

At the moment, the moral consensus against sex selection is holding. The medical profession should at least state, in public and in unity, a strong position against gender selection and a moral prohibition against genetic eugenics. But in the longer run, the rest of us may be called upon to ask whether our curiosity about gender is worth the risk that others will misuse that information. It may be wiser to learn if the baby is a "he" or a "she" the old-fashioned way.

b.

**Stop Subsidizing the Future Rich**[6]
by John R. Lott, Jr.

*College Station, Texas*—The basic problem with government subsidized student loans is that they are a subsidy to future high income people. The loans students receive carry interest rates far below what even the most stable corporations pay.

While students, especially those from relatively poor families, do not have a high standard of living during college, they enjoy above-average earnings soon after receiving their degrees. Since the loans are slowly paid off after graduation, during a period of high earnings, subsidized interest rates seem unjustified. Why should factory-workers and secretaries be taxed so would-be managers, lawyers, and doctors can be subsidized?

And subsidized federal loans are only a small part of our educational subsidies. Here at Texas A & M, each student pays only a small percentage of the $10,000-plus it annually costs the state of Texas. The great majority of these students come from relatively well-to-do families. In the cases of those few who do not, the argument about transfers to future high-income earners applies. It is important to distinguish loans *per se* from the currently heavily subsidized loans.

*While subsidized* loans are unjustified, a weak case can be made for government loan guarantees or possibly loans at unsubsidized rates. This is because of the problems created by current bankruptcy laws, which in some cases have allowed students to rid themselves of educational debt by simply declaring bankruptcy after graduation. Banks may therefore consider student loans too risky.

Unfortunately, these bankruptcy laws probably hurt children from poor families the most. For a student from a poor family, the parents' co-signature does not appreciably reduce the riskiness of the loan, since they do not own enough assets.

The simplest and best solution is to alter the bankruptcy laws to get rid of this problem. Private banks could then handle student loans entirely, with no role played by the federal government.

Evidence provided by Sam Peltzman of the University of Chicago suggests that abolishing subsidized loans will have little effect on the number of people attending higher education. The primary effect will be to end the unjustified taxing of people to subsidize the future wealthy of this country.

6. Copyright 1985 *USA TODAY*. Reprinted with permission. John R. Lott, Jr. was a visiting assistant professor of economics at Texas A&M University when he wrote this passage.

c.

**Don't Roll Back "Roe"**[7]
by John R. Silber

*Boston*—The public debate over abortion, already bitter, is likely to become even more so. Indeed, with state legislatures debating new restrictions made possible by the Supreme Court's decision in Webster v. Reproductive Health Services, consensus looks further away every day.

This bitter debate grows out of widespread confusion between legal issues and moral ones, between religious issues and political ones. We cannot develop a clear understanding of these difficult issues without considering legal and ethical points of view.

I would oppose any law prohibiting abortion in the first two trimesters. That is, I believe that the states should retain the standard set by the Supreme Court in Roe v. Wade even though Webster allows them to restrict it.

It is very doubtful, considering past experience, that restrictive legislation would do more than make presently legal abortions illegal. Some of these abortions, involving technologies that enable laymen to perform abortions safely, would be different from current abortions only in their illegality. Others, performed with coat hangers in back alleys, will be fatal. I could not in conscience recommend legislation having these effects.

But this is not the same as the "pro-choice" position. It is possible to believe that abortion ought to be legal without believing that it is an unconditional right, or even that it is morally justified in more than a limited number of cases.

Nor is the belief that many abortions are immoral the same as the "pro-life" position. There are instances when the taking of human life is justifiable, legally and morally. Homicide is not equivalent to murder. Some homicides are entirely justified, especially those involving self-defense. A woman whose life is threatened by a pregnancy is justified in terminating the pregnancy that might kill or severely injure her.

So, too, when a woman is raped she is under no obligation morally, and should be under no obligation legally, to accept the consequences of an act of sexual intercourse in which she did not voluntarily participate. She has a right to protect herself from the consequences of assault.

But this does not lead me to conclude that abortions are morally justified when the

7. Copyright © 1990 by the New York Times Company. Reprinted with permission. John R. Silber was president of Boston University.

pregnancy does not threaten the life of the mother and follows from sexual intercourse in which she voluntarily participated. Indiscriminate use of abortion is wrong because the indiscriminate taking of human life is wrong.

If abortion were not a supercharged issue, it would be apparent to all parties that a fertilized ovum is, in fact, a living human. Obviously it is not a complete human being. But neither is a fetus in the third trimester or, for that matter, a newborn infant or a child of one or two years of age. The value of the life of an infant is based on its potential to become a fulfilled human being, and that potential exists from the time of conception.

Believing firmly as I do in this moral view of abortion, I think it would be a disastrous error to write it into the statute book.

A free society cannot maintain its unity and order unless there is toleration of diverse opinions on which consensus has not been achieved. Without religious toleration, for example, the unity of the 13 Colonies would have been torn asunder by religious wars of the sort that plagued Europe for centuries. The abortion issue is for many individuals a religious issue, and on such issues we should scrupulously observe the separation of church and state.

By tolerating contrary views, we accept an important fact that is too often overlooked. The instruments of the state and its legal institutions are far too crude and inexact to be used in deciding highly complex issues of personal morality on which persons of good will fundamentally disagree. It is proper to leave such important moral and religious issues to individual moral agents and religious believers.

On the issue of abortion, there is no political, philosophical, moral or religious consensus. I believe abortion is, in general, morally wrong. But I also believe the state should not enact laws to restrict abortion further. This is an issue that cries out for toleration.

## Application of the Six-Step Procedure to Passages Containing Theoretical Statements

In the previous sections we have examined the passages containing deductive arguments without direct appeal to definitions, empirical generalizations, or theories. Consider the following passage that focuses on the theoretical underpinning of an argument.

Premise 1

*The millionaires are a product of natural selection acting on the whole body of men to pick out those who can meet the requirement of certain work to be done. . . . It is because they are thus selected that wealth—both their own and that entrusted to them—aggregates under their hands. . . . They may fairly be regarded as the naturally selected agents of society for certain work. They get high wages and live in luxury, but the bargain is a good one for society. There is the most intense competition for their place and occupation. This assures us that all who are competent for this function will be employed in it, so that the cost of it will be reduced to the lowest terms.*[8]

Premise 2

Premise 4

Although the major focus of the passage is to provide an account of why millionaires are especially competent, a preliminary reading of this passage suggests an argument justifying the rewards given to millionaires in American society.

***Reconstruction of the Argument in the Passage***

Theory-Based Premises

*(1) Millionaires are naturally selected for certain work.*

*(2) If millionaires are naturally selected, then millionaires are especially competent (fit) for their environment.*

***(implicit)*** *(3) If millionaires are especially competent (fit) for their environment, they provide great benefits for society.*

*(4) If millionaires provide a great benefit for society, then they deserve their riches.*

***(implicit)*** ∴ *Millionaires deserve their riches.*

As in previous examples, we have reconstructed the argument to make it valid (steps 1 to 3). Central to evaluating the argument according to step 4, however, is a consideration of the underlying theory of natural selection, which the author of the passage puts forward fairly directly in support of the second premise. Although the theory of natural selection is not developed in the passage, it can be presumed to contain a theoretical statement along these lines:

$T_1$: *Natural selection produces organisms that are especially fit for their environmental niche.*

Some version of this statement has backing from evolutionary biology (though modern versions of biology are more likely to hold that organisms are *adequately* suited to their environmental niche). If natural selection applies to millionaires, then $T_1$ would support the view that millionaires are suited to their

8. William Sumner, *Earth-Hunger and Other Essays* (New Haven, CT: Yale University Press, 1913), 3.

environment. But it is unclear whether the concept of "natural selection" as used in a testable biological theory (that is, in $T_1$) is used in this sense in premises 1 and 2. Crucial to the biological theory is that some inheritable trait (a trait passed down genetically from parents to offspring) is naturally selected if it improves the likelihood that the organisms having it will live to pass on the gene responsible for the trait. It is not obvious that the traits that make individuals millionaires are inheritable or that they improve the likelihood that organisms possessing them will reproduce. Indeed, some millionaires receive their wealth from their parents, not because their parents transmitted it biologically, but more directly, by having money willed to them when their parents died. Even if parents had traits of character that suited them to earn wealth, their children need not have them. Furthermore, even if there are such traits, they don't enable millionaires to reproduce more. Indeed, the wealthy tend to have fewer—not more—offspring than the poor. As we pointed out in chapter 7 in our discussion of misleading definition, an argument is faulty if it uses different definitions of a term in different premises. We have here an extension of this case. The sense of *natural selection* in biological theory doesn't seem to apply to the notion as it occurs in premises 1 and 2. As a consequence, premise 2 is not really supported by natural selection theory.

The argument is open to further criticism. Premise 3 asserts that if millionaires are suited to their environments, then they will produce great benefits for society. It is not obvious that all, or even most, activity of millionaires (say those who play the financial markets) will benefit society as a whole. Even if some millionaires (for example, Bill Gates of Microsoft or other entrepreneurs in the computer industry) do benefit society by the activities that make them rich, it is not obvious this is always or even usually the case in other areas.

## Exercise 10.2 Criticizing Arguments Based on Theories and Generalizations

Apply the six-step procedure to the following more complicated passages. Be sure to reconstruct any arguments and identify relevant theoretical statements.

1.

> Are girls really being insidiously damaged by our school systems? That question actually remains to be investigated. Everyone knows we need to improve our schools, but are the girls worse off than the boys? If one does insist on focusing on who is worse off, then it doesn't take long to see that, educationally speaking, boys are the weaker gender. Consider that today 55 percent of college

> students are female. In 1971 women received 43 percent of the bachelor's degrees, 40 percent of the master's degrees, and 14 percent of the doctorates. By 1989 the figures grew to 52 percent for B.A.'s, 52 percent for M.A.'s, and 36 percent for doctoral degrees. Women are still behind men in earning doctorates, but according to the U.S. Department of Education, the number of doctorates awarded to women has increased by 185 percent since 1971.[9]

2. **(Hint: Clearly distinguish between the argument and theory attributed to the Wellesley Report and Sommers's own argument and theory.)**

> The Wellesley Report ["How Schools Shortchange Girls"[10]] is correct when it points out that American girls are trailing boys in math and science. The gap is small but real, and the report is right to suggest that schools must make every effort to "dispel myths about math and science as 'inappropriate' fields for women." Unfortunately, that sound suggestion is accompanied by more than twenty questionable and distressing recommendations that would, if acted upon, create a nightmarish "gender equity" bureaucracy with plenty of time and money on its hands—just the sort of recommendation anyone who cares about the well-being of American Schools should fear and loathe: "The U.S. Department of Education's Office of Education Research and Improvement (OERI) should establish an advisory panel of gender equity experts to work with OERI to develop a research and dissemination agenda to foster gender-equitable education in the nation's classrooms."
>
> Who would be training the gender experts? Who would monitor the nation's schools on how well they conform to the ideals of a correct sexual politics? More generally, who would benefit most from the millions being requested for the Gender Equity in Education Act? Would it not be those who insist that gender equity is our foremost educational problem? Our system cannot handle much more pressure from these muddled but determined women with their multistage theories and their metaphors about

9. Reprinted with the permission of Simon & Schuster. Christina Hoff Sommers, *Who Stole Feminism: How Women Have Betrayed Women* (New York: Simon & Schuster, 1995), 160. Copyright 1994 by Christina Sommers. Reprinted with permission.

10. *The AAUW Report: How Schools Shortchange Girls* (Washington, D.C.: AAUW Educational Foundation, 1992).

windows, mirrors, and voices, their workshops, and above all the constant alarms about the state of male-female relations in American society.

Which leads us back to what is most wrongheaded about the Wellesley Report: its exploitation of America's very real problem as a nation educationally at risk. Despite its suggestion that solving the "problem of gender equity" will somehow help us to bridge the gap between American children and the educationally superior children of other countries—what the education researcher Harold Stevenson aptly calls the "learning gap"—the report never says how. The reason for the omission is obvious: the authors have no plausible solution to offer.

In 1992, the Mathematical Association of America published a translation of the math section of Japan's 1990 college entrance exam. American mathematicians were startled by what they saw. Professor Richard Askey, a mathematician at the University of Wisconsin, spoke for many American scientists and mathematicians when he said, "The level at which [Japanese] students perform on these [exams] is just incredible." . . .

American educators sometimes explain away the discrepancies by pointing out that only the best students in Japan take the test. In 1987, for example, 31 percent of American college-age students took the SAT; in Japan the figure was 14 percent for the Japanese equivalent of the SAT. But even our very best students had a hard time matching the *average* score of the Japanese students. Studies by Professor Jerry Becker, of Southern Illinois University, and by Floyd Mattheis, of East Carolina University, tell the same story. Becker reports that the problem is not simply that Japanese students as a whole outperform our students but the "*average* students in Japan show greater achievement than the top five percent of U.S. students" (his emphasis). Mattheis compared junior high students in Japan and North Carolina. Reporting on his study, *Science* magazine says, "It shows Japanese students out front at every age group in a test that measures six logical thinking operations." . . . What of the gender gap between American boys and girls in math? As noted earlier, the Educational Testing Service (in its International Assessment of Mathematics and Science) found that although thirteen-year-old American girls lag a point behind the boys, the gap is insignificant compared to the one between American children and foreign children. Recall that the disparity between our boys and Taiwanese and Korean *girls* was 16 points.

Some theorists speculate that Asian children do better at math because their languages are so complex and abstract, providing better preparation in the cogni-

tive skills required for math and science. That does not help to explain why American children lag behind European and Canadian students too. Girls in French-speaking Quebec outperform our boys by 12 points on the IAEP math test. In fact American boys lag behind girls in such countries as Ireland, Italy, and Hungary. In science the results, although not quite so dismaying, continue the pattern: American boys trail significantly behind the foreign girls.[11]

3.

**The Closing of the American Mind: How Higher Education Has Failed Democracy and Impoverished the Souls of Today's Students**[12]

*Introduction: Our Virtue*

When I was a young teacher at Cornell, I once had a debate about education with a professor of psychology. He said that it was his function to get rid of prejudices in his students. He knocked them down like tenpins. I began to wonder what he replaced those prejudices with. He did not seem to have much of an idea of what the opposite of a prejudice might be. He reminded me of the little boy who gravely informed me when I was four that there is no Santa Claus, who wanted me to bathe in the brilliant light of truth. Did this professor know what those prejudices meant for the students and what effect being deprived of them would have? Did he believe that there are truths that could guide their lives as did their prejudices? Had he considered how to give students the love of the truth necessary to seek unprejudiced beliefs, or would he render them passive, disconsolate, indifferent, and subject to authorities like himself, or the best of contemporary thought? My informant about Santa Claus was just showing off, proving his superiority to me. He had not created the Santa Claus that had to be there in order to be refuted. Think of all we learn about the world from men's belief in Santa Clauses, and all that we learn about the soul from those who believe in them.

By contrast, merely methodological excision from the soul

11. Sommers, *Who Stole Feminism,* 178–180.

12. Allan Bloom, *The Closing of the American Mind: How Higher Education Has Failed Democracy and Impoverished the Souls of Today's Students* (New York: Simon & Schuster, 1987). Copyright © 1987 by Allan Bloom. Reprinted by permission of Simon & Schuster, Inc.

of the imagination that projects Gods and heroes onto the wall of the cave does not promote knowledge of the soul; it only lobotomizes it, cripples its powers.

I found myself responding to the professor of psychology that I personally tried to teach my students prejudices, since nowadays with the general success of his method they had learned to doubt beliefs even before they believed in anything. Without people like me, he would be out of business. Descartes had a whole wonderful world of old beliefs, of prescientific experience and articulations of the order of things, beliefs firmly and even fanatically held, before he even began his systematic and radical doubt. One has to have the experience of really believing before one can have the thrill of liberation. So I proposed a division of labor in which I would help to grow the flowers in the field and he could mow them down.

Prejudices, strong prejudices, are visions about the way things are. They are divinations of the order of the whole of things, and hence the road to a knowledge of that whole is by way of erroneous opinions about it. Error is indeed our enemy, but it alone points to the truth and therefore deserves our respectful treatment. The mind that has no prejudices at the outset is empty. It can only have been constituted by a method that is unaware of how difficult it is to recognize that a prejudice is a prejudice. Only Socrates knew, after a lifetime of unceasing labor, that he was ignorant. Now every high-school student knows that. How did it become so easy? What accounts for our amazing progress? Could it be that our experience has been so impoverished by our various methods, of which openness is only the latest, that there is nothing substantial enough left there to resist criticism, and we therefore have no world left of which to be really ignorant? Have we so simplified the soul that it is no longer difficult to explain? To an eye of dogmatic skepticism, nature herself, in her lush profusion of expressions, might appear to be a prejudice. In her place we put a gray network of critical concepts, which were invented to interpret nature's phenomena but which strangled them and therewith destroyed their own raison d'être. Perhaps it is our first task to resuscitate those phenomena so that we may again have a world to which we can put our questions and be able to philosophize. This seems to me to be our educational challenge. . . .

*The Student and the University: Liberal Education*

What image does a first-rank college or university present today to a teenager leaving home for the first time, off to the adventure of a liberal education? He has four years of freedom to discover himself—a space between the intellectual wasteland he has left behind and the

inevitable dreary professional training that awaits him after the baccalaureate. In this short time he must learn that there is a great world beyond the little one he knows, experience the exhilaration of it, and digest enough of it to sustain himself in the intellectual deserts he is destined to traverse. He must do this, that is, if he is to have any hope of a higher life. These are the charmed years when he can, if he so chooses, become anything he wishes and when he has the opportunity to survey his alternatives, not merely those current in his time or provided by careers, but those available to him as a human being. The importance of these years for an American cannot be overestimated. They are civilization's only chance to get to him.

In looking at him we are forced to reflect on what he should learn if he is to be called educated; we must speculate on what the human potential to be fulfilled is. In the specialties we can avoid such speculation, and the avoidance of them is one of specialization's charms. But here it is a simple duty. What are we to teach this person? The answer may not be evident, but to attempt to answer the question is already to philosophize and to begin to educate. Such a concem in itself poses the question of the unity of man and the unity of the sciences. It is childishness to say, as some do, that everyone must be allowed to develop freely, that it is authoritarian to impose a point of view on the student. In that case, why have a university? If the response is "to provide an atmosphere for learning," we come back to our original questions at the second remove. Which atmosphere? Choices and reflection on the reasons for those choices are unavoidable. The university has to stand for something. The practical effects of unwillingness to think positively about the contents of a liberal education are, on the one hand, to ensure that all the vulgarities of the world outside the university will flourish within it, and, on the other, to impose a much harsher and more illiberal necessity on the student—the one given by the imperial and imperious demands of the specialized disciplines unfiltered by unifying thought.

The university now offers no distinctive visage to the young person. He finds a democracy of the disciplines—which are there either because they are autochthonous or because they wandered in recently to perform some job that was demanded of the university. This democracy is really an anarchy, because there are no recognized rules for citizenship and no legitimate titles to rule. In short there is no vision, nor is there a set of competing visions, of what an educated human being is. The question has disappeared, for to pose it would be a threat to the peace. There is no organization of the sciences, no tree of knowledge. Out of chaos

emerges dispiritedness, because it is impossible to make a reasonable choice. Better to give up on liberal education and get on with a specialty in which there is at least a prescribed curriculum and a prospective career. On the way the student can pick up in elective courses a little of whatever is thought to make one cultured. The student gets no intimation that great mysteries might be revealed to him, that new and higher motives of action might be discovered within him, that a different and more human way of life can be harmoniously constructed by what he is going to learn.

Simply, the university is not distinctive. Equality for us seems to culminate in the unwillingness and incapacity to make claims of superiority, particularly in the domains in which such claims have always been made—art, religion and philosophy. When Weber found that he could not choose between certain high opposites—reason vs. revelation, Buddha vs. Jesus—he did not conclude that all things are equally good, that the distinction between high and low disappears. As a matter of fact he intended to revitalize the consideration of these great alternatives in showing the gravity and danger involved in choosing among them; they were to be heightened in contrast to the trivial considerations of modern life that threatened to overgrow and render indistinguishable the profound problems the confrontation with which makes the bow of the soul taut. The serious intellectual life was for him the battleground of the great decisions, all of which are spiritual or "value" choices. One can no longer present this or that particular view of the educated or civilized man as authoritative; therefore one must say that education consists in knowing, really knowing, the small number of such views in their integrity. This distinction between profound and superficial—which takes the place of good and bad, true and false—provided a focus for serious study, but it hardly held out against the naturally relaxed democratic tendency to say, "Oh, what's the use?" The first university disruptions at Berkeley were explicitly directed against the multiversity smorgasbord and, I must confess, momentarily and partially engaged my sympathies. It may have even been the case that there was some small element of longing for an education in the motivation of those students. But nothing was done to guide or inform their energy, and the result was merely to add multi-life-styles to multidisciplines, the diversity of perversity to the diversity of specialization. What we see so often happening in general happened here too; the insistent demand for greater community ended in greater isolation. Old agreements, old habits, old traditions were not so easily replaced.

Thus, when a student arrives at the university, he finds a bewildering variety of departments

and a bewildering variety of courses. And there is no official guidance, no university-wide agreement, about what he should study. Nor does he usually find readily available examples, either among students or professors, of a unified use of the university's resources. It is easiest simply to make a career choice and go about getting prepared for that career. The programs designed for those having made such a choice render their students immune to charms that might lead them out of the conventionally respectable. The sirens sing sotto voce these days, and the young already have enough wax in their ears to pass them by without danger. These specialties can provide enough courses to take up most of their time for four years in preparation for the inevitable graduate study. With the few remaining courses they can do what they please, taking a bit of this and a bit of that. No public career these days—not doctor nor lawyer nor politician nor journalist nor businessman nor entertainer—has much to do with humane learning. An education, other than purely professional or technical, can even seem to be an impediment. That is why a countervailing atmosphere in the university would be necessary for the students to gain a taste for intellectual pleasures and learn that they are viable.

The real problem is those students who come hoping to find out what career they want to have, or are simply looking for an adventure with themselves. There are plenty of things for them to do—courses and disciplines enough to spend many a lifetime on. Each department or great division of the university makes a pitch for itself, and each offers a course of study that will make the student an initiate. But how to choose among them? How do they relate to one another? The fact is they do not address one another. They are competing and contradictory, without being aware of it. The problem of the whole is urgently indicated by the very existence of the specialties, but it is never systematically posed.

## Putting Convergent Arguments into the Picture

We have concentrated in this chapter and in the book as a whole largely on linked arguments either to illuminate the structure for a whole passage or to provide arguments that support particular premises. But as we mentioned in chapter 8, it is often useful to display a complex passage as having the structure of a convergent argument. In this section we will look at an example in which a conver-

gent argument is used to support a premise for a larger, embracing linked argument. Passage 10.3, which begins on the next page, provides an example.

The headline *Teachers assault online college, put self-interest over education* suggests an embracing linked argument along these lines.

***(implicit)*** *(1) If Jones International University clearly offers a quality education, then teachers' harsh criticism of it puts self-interest over education.*

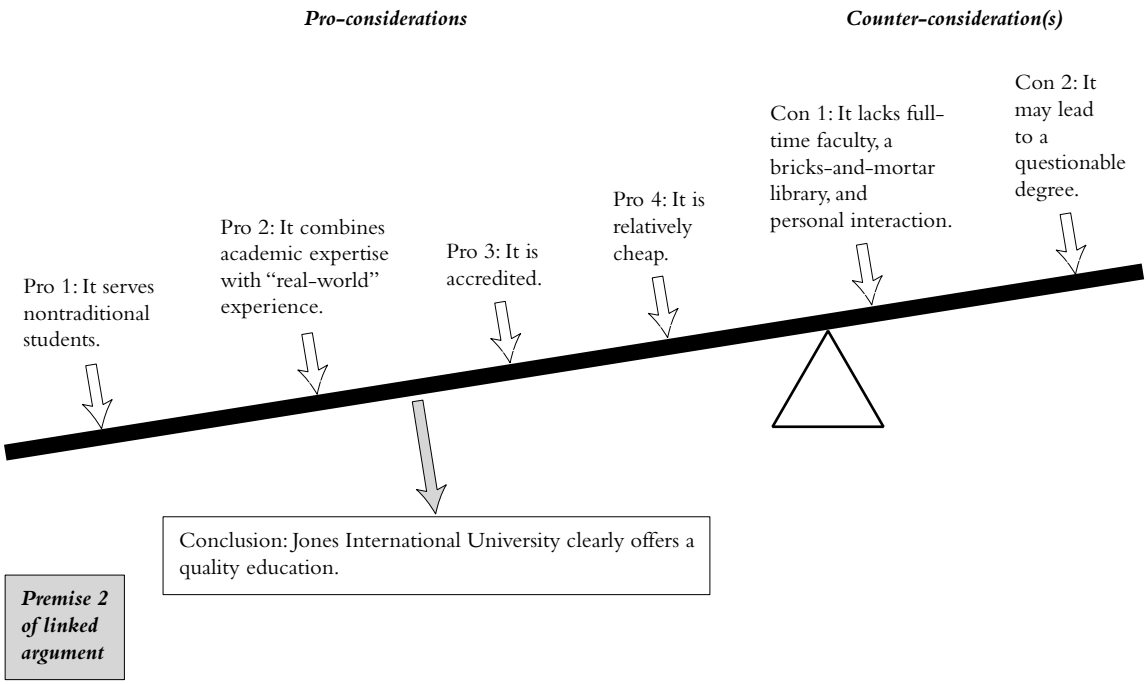
***(supported by a convergent argument)*** *(2) Jones International University clearly offers a quality education.*

---

∴ *Teacher's harsh criticism of Jones International University puts self-interest over education.*

At the center of this passage is a convergent argument in support of premise 2. It has the following form:

## Diagram of Convergent Argument with Counter-Consideration in Passage 10.3


Pro-considerations
Counter-consideration(s)
Pro 1: It serves nontraditional students.
Pro 2: It combines academic expertise with "real-world" experience.
Pro 3: It is accredited.
Pro 4: It is relatively cheap.
Con 1: It lacks full-time faculty, a bricks-and-mortar library, and personal interaction.
Con 2: It may lead to a questionable degree.
Conclusion: Jones International University clearly offers a quality education.
Premise 2 of linked argument

***Today's debate: Higher education on the Web***

**Teachers assault online college, put self-interest over education**[13]

by Grant Jarding

Our View: Why fight learning at home—particularly when it is accredited?

The courses are taught on the Web. Students and faculty meet via e-mail. The library is digital, and the five students who earned degrees last spring got them at a cybergraduation. Now, Jones International University, the first college to function entirely in cyberspace, has acquired one crucial trapping of tradition—a seal of approval from a respected accrediting group.

That prize, awarded this spring after a four-year effort, marks a coming of age not only for Jones but also for students seeking a college education on this new frontier. It opens the way for Jones students to apply for federal aid not available at unaccredited colleges. And provides at least some assurance that a Jones degree will be worth something.

With all of that progress, professors should be cheering. Instead, Jones' accreditation is under fire by members of several national teachers associations who see it an affront to quality.

They focus on what's missing at an e-university: a traditional full-time faculty, a bricks-and-mortar library, personal interaction between professors and students. With students able to get federal loans, critics say, the unwary could end up with nothing more than a questionable degree and huge debts.

Certainly the pioneering cyber-universities are different, but that's just their point. They offer education to students who need to sign on from kitchens or home offices, during pre-dawn hours or breaks at work. Most of the 600 students at Jones, for instance, are over age 28, with full-time jobs.

Working at an individual pace, students talk with faculty and each

***Cybercollege***

Jones International University, the first all-cyber college, offers a degree at about half the cost of a traditional college, when living and transportation are factored in.

| Yearly costs | Jones International | Four-year public college |
|---|---|---|
| Tuition and fees | $3,908 | $3,356 |
| Books and supplies | $625 | $681 |
| Estimated Internet service | $300 | 0 |
| Room, board, transportation | 0 | $4,730 |
| Total | $4,833 | $8,767 |

Source: Jones International University; The College Board

13. *USA TODAY,* 5 February 1999.

other in chat rooms or by e-mail. During one recent online forum, experts signed on from various locations and chatted with students in several countries, a more personal education encounter than a lecture to 500.

Jones' courses are developed by professors at well-known schools and taught by separate Jones faculty members, prompting a gripe that such duties shouldn't be divided. But Jones' professors often work in the fields they're teaching, adding real-world zest to the curriculum.

As to the fear that these may be little more than expensive diploma mills, that's a risk at any new college and a concern that accreditation is designed to ally.

Many top universities have joined the online rush, offering single courses or specialty degrees. What makes Jones different is its all-cyber existence, save for some business offices in Colorado. What makes it threatening to traditional colleges is its ability to offer courses for an accredited bachelor's degree at around $4,800 a year, about half the tuition, room and board costs at public colleges.

For now, Jones is a fledgling experiment. Most students drop in for a course or two, with only about 100 seeking degrees. Accreditation may help it thrive.

More important is what accreditation means to prospective students. Experts say cyber-diploma scams are growing fast, with a few e-schools moving offshore and paying foreign governments in an attempt to buy legitimacy.

Accreditation proves a needed yardstick to measure quality. In the new world of virtual colleges, it's good to know that real, live educators are checking them out.

As the summary box indicates, we can criticize a convergent argument by showing that some considerations are doubtful. For example, we could challenge the claim that *Jones International University is relatively cheap* by pointing out that the chart contained in the passage itself shows that most of the difference in costs arise because the four-year college total contains cost of room and board and Jones International does not. But of course students using the cybercollege will still be paying for food and shelter—perhaps even more than college students living on campus.

**Criticizing Convergent Arguments (from chapter 8)**

1. Adding further considerations
2. Eliminating doubtful considerations
3. Blunting or promoting considerations

Even if we eliminate this pro-consideration, the article cites three other pro elements. The question is then whether the remaining pros outweigh the cons. We can criticize the weighting in the article in two ways: *blunting* the

pro-considerations or promoting the con-considerations. For example, the article stresses that Jones International University is accredited, but a critic could point out that mere accreditation need not assure "quality" in education. The accrediting organizations determine only that an institution has met a minimum standard. This in itself does not give much support to the conclusion that it offers a "quality" education, only that it is not unacceptably bad education. Alternatively, a critic might try to *promote* the counter consideration that the cybercollege, at least at this point in time, offers a degree of questionable value for the students, both in terms of employment or graduate education and that is of central importance. Sustained criticism of either of these types could shift the balance against the conclusion.

## Exercise 10.3 Criticizing Linked and Convergent Arguments

1. The following passages contain arguments that could be interpreted as convergent or linked or a hybrid of both. Reconstruct and criticize them.

   a.

> We have now recognized the necessity to the mental well-being of mankind (on which all their other well-being depends) of freedom of opinion, and freedom of the expression of opinion, on four distinct grounds, which we will now briefly recapitulate:
>
> First, if any opinion is compelled to silence, that opinion may, for aught we can certainly know, be true. To deny this is to assume our own infallibility.
>
> Secondly, though the silenced opinion be an error, it may, and very commonly does, contain a portion of truth; and since the general or prevailing opinion on any subject is rarely or never the whole truth, it is only by the collision of adverse opinions that the remainder of the truth has any chance of being supplied.
>
> Thirdly, even if the received opinion be not only true, but the whole truth; unless it is suffered to be, and actually is, vigorously and earnestly contested, it will, be most of those who received it, be held in the manner of a prejudice, with little comprehension or feeling of its rational grounds. And not only this, but, fourthly, the meaning of the doctrine itself will be in danger of being lost or enfeebled, and deprived of its vital effect on the character and conduct: the dogma becoming a mere formal profession, inefficacious for good, but cumbering the ground and preventing the growth of any real and heart-felt conviction from reason or personal experience.[14]

14. John Stuart Mill, *On Liberty* (Cambridge: Hackett Publishing Company, Inc., 1978), 50.

b.

> The splitting of the atom and the unraveling of the DNA double helix represent the two premier scientific accomplishments of the twentieth century, the first a tour de force of physics, the second of biology. . . . If the century just passing was the age of physics and nuclear technology its crown jewel, then the century just coming into view will belong to biology and its premier technology will be genetic engineering. . . . While the twenty-first century will be the Age of Biology, the technological application of the knowledge we gain can take a variety of forms. To believe that genetic engineering is the only way to apply our newfound knowledge of biology and the life sciences is limiting and keeps us from entertaining other options which might prove even more effective in addressing the needs and fulfilling the dreams of current and future generations. . . . the question is what kind of biotechnologies will we choose in the coming Biotech Century? Will we use our new insights into the working of plants and animal genomes to create genetically engineered "super crops" and transgenic animals, or new techniques for advancing ecological agriculture and more humane animal husbandry practices? Will we use the information we're collecting on the human genome to alter our genetic makeup or to pursue new sophisticated health prevention practices? . . . Since it is impossible to be clairvoyant and know all of the potential ramifications and consequences that might accompany the many new technologies we might want to introduce, we should attempt to minimize regrets and keep open as many options as possible for those who come after us—including our fellow creatures. This means that when choosing among alternative technological applications, we are best served by taking the less radical, more conservative approach—the one least likely to create disruptions and externalities. "First, do no harm" is a well established and long revered principle in medicine. . . . Which of the two competing visions of biotechnology—genetic engineering or ecological practices and preventive health—is more radical and adventurous and most likely to cause disequilibrium and which is the more conservative approach and least likely to cause unanticipated harm down the line? The answer, I believe is obvious.[15]

15. Jeremy Rifkin, *The Biotech Century: Harnessing the Gene and Remaking the World* (New York: Tarcher/Putnam, 1998), 231–234.

c.

**The Price of This Beauty Is Too High**[16]

A Web site auctioning the eggs of fashion models promotes an unhealthy idea. It encourages parents to fixate on their child's physical appearance.

Ron Harris, a fashion photographer, organized the auction. Bids start at $15,000 and can go as high as $150,000. Harris characterizes the sale of models' eggs as "Darwin at his very best." American society is obsessed with celebrity beauty, Harris says in trying to justify the sale. At the Web site, he writes: "If you could increase the chance of reproducing beautiful children, and thus giving them an advantage in society, would you?"

He also states: "It is not my intention to suggest we make a super society of only beautiful people. This site simply mirrors our current society in that beauty always goes to the highest bidder.

The commercial aspect of Harris' enterprise isn't so unusual. Sperm has been available essentially as a commodity for years now. The most notorious example is the genius sperm bank which included donations form William Shockley, a Nobel Prize-winning scientist. Harris says, in fact, that he plans an online auction of sperm in the future.

It's also true that women who donate their eggs deserve monetary compensation for inconvenience and discomfort they experience as a result of hormone treatments and physical removal of the eggs. A payment in range of $2,500 to $5,000 is most common.

The last thing American society needs, however, is the shallow beauty worship Harris promotes. Harris is encouraging parents to engineer a desired appearance for their child—hardly a healthy philosophy around which to build a family. There's no guarantee, after all, that the children produced through Harris' project will meet the parent's expected standards of beauty. If the parents wind up with a boy or girl they considered an ugly duckling, the child could be weighed down by horrible burden.

Harris' beauty-obsessed rhetoric would have the world imagine that people with less-than-perfect features are somehow inferior. But modest physical attributes needn't stop individuals from achieving greatness. Consider the great good accomplished by

16. Editorial, *Omaha World-Herald,* 27 October 1999. Reprinted with permission.

Abraham Lincoln, whose physical appearance was such that his political foes derided him as an "ape." Albert Einstein had puffy hair, yet he turned modern science inside-out with his revolutionary thinking. Golda Meir may not have been a beauty queen, but she proved to be a strong leader of Israel.

Parents often discover that their child falls short in one regard or another, or that their child has developed interests far different from what the parents had expected—and yet the parents' love remains undiminished.

Harris urges parents to look on their children as physical objects. Well-adjusted parents, however, regard their offspring as individuals—precious yet imperfect individuals. And they love them for what they are.

d.

**The Fight's Not Over**[17]

"The so-called zero-tolerance policy is without mercy and without sensitivity," the Reverend Jesse Jackson declared last week, protesting the Decatur, Illinois, school board's decision to expel six students for inciting a melee at a football game. Jackson is not alone in his view. The American Civil Liberties Union, civil rights leaders, and others on the left also want zero-tolerance laws abolished. Illinois Representative Bobby Rush is calling for congressional hearings on their legality; he's even asked U.S. Attorney General Janet Reno for an investigation.

And it's true that zero-tolerance laws are sometimes flawed in design or execution. It's also true that they effectively combat perhaps the greatest crisis in public education today: the crisis of violence. To call them inherently racist is to imply that a strictly disciplined school, a school where students learn without fear, serves only the interests of whites. And it is that proposition, it seems to us, that represents racism of the most debilitating kind.

In fact, zero tolerance has a liberal pedigree; it was originally the brainchild of the late Albert Shanker's American Federation of Teachers (AFT). In Cincinnati in 1990, the AFT discovered that local teachers were spending enormous amounts of time dealing with drugs, guns, assaults, and brawls.

17. Editorial, *The New Republic,* 6 December 1999. Reprinted by permission of The New Republic, Inc.

"In basically half the classrooms in the city, the teachers couldn't teach effectively," said Tom Mooney, vice president of the union. In 1991, Cincinnati responded but establishing automatic penalties for students who commit violent acts or are caught with drugs, alcohol, or weapons. Texas followed suit two years later. In 1994, Congress required states to pass zero-tolerance laws or forfeit federal money.

Since then, counties and cities have extended the list of zero-tolerance violations. And while these statutes have led to occasional excesses—such as the eighth-grade honors student in Georgia suspended for bringing his French teacher a bottle of vintage wine as a Christmas present—in most cases the laws are working. In Texas, a survey found that from 1993 to 1998, the percentage of teachers who viewed assaults on students as a "significant problem" dropped from 53 to 31. In Baltimore, where schools had been rife with violence, an aggressive zero-tolerance law adopted last spring has produced a 30 percent drop in student assaults on other students and a 50 percent decrease in student assaults on teachers and other staff.

But, for the critics, the evidence that zero tolerance makes schools safer is beside the point. The victims of school violence are not the ones over whom they lose sleep. What, they ask, do such laws do for the students who get suspended or expelled? Ruth Zweifler, executive director of the Michigan Student Advocacy Center, says that her state's zero-tolerance law "erodes our commitment to public education. Underneath it is the message that we no longer believe we need to educate all children." No; the message is that we will not, in the name of educating all children, force the vast majority to live under conditions that make education impossible. Shanker, a holdover from an age of grittier, less therapeutic liberalism, understood this. "Some people," he said in 1995, "think of schools as sort of custodial institutions. . . . Or they think the school's job is socialization. . . . The central role of the schools . . . is academic achievement. We have to be tough because basically we are defending the right of children to an education."

Behind the other objections, of course, lies one central one: that zero-tolerance laws are racist. The NAACP cites statistics showing that black students are more likely than white students to be suspended or expelled. To be sure, when a particular school singles out blacks and coddles whites, school boards should conduct a careful review. But, in most cases, the racial disparity in expulsions is smaller than the racial disparity in arrests for

violent crimes. That African American students may be statistically more likely than other students to commit violent acts is a grave problem that demands serious government attention to the conditions under which African American children grow up. But to use that disparity as a reason to tolerate acts of violence is to condemn innocent children, many of them black, to regimes of terror. To call such a policy compassionate is a profound linguistic and moral distortion.

Not so long ago, it was common place for liberals to sanction such distortions. Thankfully, and with great effort (some of it expended on these pages), liberalism has largely rid itself of its propensity to equate moral decency with the indulgence of immoral behavior. Liberals, by and large, no longer assume that compassion means light sentences for criminals or allowing the able-bodied to claim government money absent a day's work. As Decatur shows, however, the battle is not completely won. Permissive liberalism, like all dying creeds, has its last bastion. How unfortunate that it is the American school.

## Application to Writing

The six-step procedure can be adapted to assist in the writing of a critical essay. The format we recommend can be used to present a critical assessment of almost any discourse that contains an argument—a speech, essay, editorial, letter to the editor, or even a portion of a conversation.

It is often effective to arrange a critical essay into four parts: an introduction, a reconstruction of the argument to be criticized, a critical assessment of the argument, and a conclusion. Although this structure is not a formula to follow blindly, it is a model that can be adapted to a variety of writing tasks.

The *introduction* should convey the importance of the critical discussion to follow. A good way of doing this is to relate the particular essay, speech, or whatever to some broader issue on which the argument at hand has some bearing. One way of unifying your essay is to move in the introduction from a broad topic of concern to the particular issue at hand, and then to move back to the broad area of concern in your conclusion.

The *reconstruction of the argument* should begin with a paraphrase (or quotation) conveying the argument in unreconstructed form. This paraphrase should be done as succinctly as possible to avoid losing the flow of the essay at this point. Then you should introduce any necessary implicit statements and give the

complete argument. For purposes of the essay assigned at the end of this section, you may use technical terms such as *standard form* or *implicit premise.* But in general, suit your terminology to the audience for whom you are writing.

The *critical assessment* should begin with a statement of whether the conclusion of the argument follows from the premises. If it doesn't, demonstrate this to the reader as clearly as possible. (Refer to chapter 4 for tips on showing invalidity.) If the argument can be made valid by adding more premises, discuss this in either the reconstruction or the critical portion. Next, discuss whether the premises are acceptable. Remember to criticize specific premises, one at a time. If you decide that the premises are acceptable, you should still try to raise criticisms you think might be made by an intelligent reader and reply to these criticisms on behalf of the argument. If a vague or ambiguous term occurs in more than one place in the argument, use the techniques described in chapter 7 to explain how different interpretations of the meaning of this term will affect the argument.

The conclusion should restate briefly your final assessment of the argument. If you reject the argument, you could attempt to explain here why the arguer might have been persuaded by it even though it is a bad argument. You could also return in your conclusion to the broader concerns you raised in your introduction—the importance of the issue, what position now seems reasonable in regard to it, and so forth.

To get a better idea of how this format can be used, read the following excerpt from a speech on the subject of crime and its causes and the sample critical essay that follows it. The sample essay criticizes an argument from the speech.

**OUR PERMISSIVE SYSTEM OF CRIMINAL JUSTICE**

*Violence is no longer the manufactured melodrama of the theatrical arts. It has become part of our everyday life—gruesome tragedies, perpetrated against our next-door neighbor, our family and our friends, personally touching each of us. Mathematically, one out of every five families will have a major crime committed against some member of that family.*

*Crime is the product of flesh and blood individuals—individuals who choose to satisfy their carnal, fiscal and physical desires by denying the rights of others . . . individuals who willfully choose to assault the person or take over the property of other human beings.*

*Aided, I might add, by accomplices. Accomplices who have contributed to the rise in crime. These friends of the felon are the professional apologists, the excuse makers, the contemporary environmentalists, the behaviorists . . . those people who are more interested in bleeding hearts than bleeding victims. They are the ones who blame everybody and everything, except the responsible individual.*

*Advocates of this philosophy reside in the present Department of Corrections, including its Division of Parole, and also within the probation departments of our counties. It is taught in our universities and colleges as modern penology and*

*promoted as fact, not theory. This social philosophy is especially attractive to those who dislike the competition of the American way of life—the kind of life where a man is responsible for his own actions. The concept that man controls his own destiny and is accountable is anathema to the Socialist mind.*

*One point that apologists rarely explain away is why, for every criminal who comes from a slum area, are there thousands from the same area who hold jobs? Why, for every under-educated criminal, are there thousands of successful individuals who made it with less education? Why, for every unemployed criminal, are there thousands who never had to resort to crime as a means of survival?*

*I was raised in a factory town on the south side of Chicago, a tough neighborhood, what some would call an economically deprived area by today's standards. I dropped out of high school after only two years and joined the Navy to fight for my country in the Second World War. I also came from a broken home. So, I was a high school drop-out, from an economically deprived area and a broken home. I must assume that all those with the same background will grow up to be senators.*

*It isn't society nor environment that commits crimes. Criminals commit crimes . . . individuals. Criminal individuals commit crimes.*[18]

## IS THE ENVIRONMENT THE CAUSE OF CRIME?

In his speech "Our Permissive System of Criminal Justice," Senator H. L. Richardson expresses his anger toward those who claim that the environment, rather than the individual criminal, is responsible for crime. He believes not only that this theory is false, but also that people who propose it have aided criminals and helped crime to flourish. It can be questioned whether this theory has really contributed to a rise in crime, but I will limit this essay to the question of whether Richardson has given us grounds for believing that the environment is not the cause of crime.

Richardson's argument is essentially that not everyone from a "slum area" is a criminal, so it is not the slum area that is the cause of crime. This argument contains the implicit premise that if slum areas did cause crime, then everyone from a slum area would be a criminal. If we add this premise, the argument can be stated as follows:

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18. Excerpts from a speech by California Senator H. L. Richardson, "Time to Reaffirm Basic Truths About Crime," *Human Events,* 31 August 1974, 18–19. Reprinted with permission of the publisher.

1. If slum areas caused crime, then everyone from a slum area would be a criminal.
2. Not everyone from a slum area is a criminal.

∴ Slum areas do not cause crime.

Supposedly, Richardson would make this same argument about other environments besides slum areas that might be thought to cause crime. Otherwise, he could not come to his general conclusion that the environment does not cause crime. If we put his argument in a more general way, it would look like this:

1. Given any environment, if that environment caused crime, then everyone from that environment would be a criminal.
2. Given any environment, not everyone from that environment is a criminal.

∴ No environment causes crime.

Both of these arguments are valid, but it is doubtful that all their premises are true. Consider premise 1 of either argument—that if slum areas (or some other environment) caused crime, then everyone from that area would be a criminal. There is a sense of *cause* in which we would say that one thing caused another even if it did not *always* produce this effect. For example, we say that drunken driving causes accidents even though people sometimes drive while drunk without having an accident. Similarly, those who say that slum areas cause crime might mean that these areas tend to produce criminals, and are therefore at least partially responsible for crime. It would not follow that everyone from a slum area must be a criminal.

As was stated earlier, Richardson must make his argument a general one about any environment if he wishes to come to the general conclusion that no environment causes crime. The second premise of this general argument is: Given any environment, not everyone from that environment is a criminal. It is not at all obvious that this premise is true. Suppose we take a poor neighborhood as an example of an environment. Many people from this environment

will not be criminals. But suppose we narrow down the environment further by considering only the homes of male teenagers who have friends who commit crimes regularly. Now a larger percentage of the people from this environment will be criminals like their friends. And we could continue to narrow down the environment to include only teenagers who had been treated brutally as young children, and so on. It is at least possible that we would end up describing an environment that always produced criminals.

The issue of whether the environment is the cause of crime is an important one. The attitude we take regarding it affects the course of action we would recommend in combating crime. There may be grounds, other than those that Richardson provides, for believing that the environment is not responsible for crime. It is also possible, as our first criticism suggests, that Richardson has presented us (and himself) with a false dilemma in assuming that either the environment is wholly responsible or the individual is wholly responsible. Perhaps it was his eagerness not to let individual criminals "off the hook" that prompted him to argue that the environment has no causal role in producing criminals. This essay has shown that whatever his motive for advancing it, Richardson has not given us sufficient reason to accept his conclusion.

## Exercise 10.4 Writing a Critical Essay

Using the recommended format, write an essay criticizing one of the following selections (or another appropriate editorial or essay). A number of arguments are presented here, but most of the premises and conclusions are unstated or not clearly stated. Read the editorial carefully several times before you attempt to reconstruct an argument from it.

1.

**Legal Drugs Unlikely to Foster Nation of Zombies**[19]
by Stephen Chapman

There is good news and bad news about cocaine. The bad news is that captive monkeys given unlimited access to the stuff will spurn everything else to get high, until they die of starvation.

The good news is you're not a monkey. In a society of lower primates, which are incapable of prudent restraint in the use of mind-altering substances, legalizing cocaine and other illicit drugs would probably be a bad idea. When it comes to humans, the issue looks a bit different.

We know that a 20-year government effort to stamp out illicit drug use has been a colossal failure. We know it has swallowed vast amounts of money, prison space and police time. We know it has spawned epidemics of violent crime in the inner city, much as Prohibition sparked gangland wars.

What we don't know is what would happen if drugs were legal. Would we become a nation of zombies—a "citizenry that is perpetually in a drug-induced haze," as drug czar William Bennett predicts?

Bennett says we don't have to try legalization to know how horrible it would be: "We have just undergone a kind of cruel national experiment in which drugs became cheap and widely available: That experiment is called the crack epidemic."

But what keeps clean-living citizens like Bennett from becoming crackheads? Is it the fear of jail? If crack were sold at a legal outlet around the corner, would he pick up a case? Would Miss America?

Would you? Not likely. A poll sponsored by the Drug Policy Foundation asked Americans if they would try illicit drugs if they were legal. Of those who had never tried marijuana before, only 4.2 percent of those questioned said they would try it. Fewer than 1 percent of those who had never used cocaine said they'd take it out for a test drive.

That 1 percent can be mightily grateful to Bill Bennett for deterring them. The other 99 percent gain essentially nothing from the drug war. In fact, if they live in the inner city, the drug war puts them in danger every day by reserving the business for violent people with lots of guns and ammo.

The poll confirms the few experiments with drug tolerance. After the Netherlands practically legalized marijuana in 1976, its use declined. In the various U.S. states that decriminalized marijuana in the 1970s, pot grew less popular.

19. Copyright 1990 by Stephen Chapman. Reprinted by permission.

Even if everyone were tempted to sample the newly legal drugs, very few would imitate monkeys. The government's National Institute on Drug Abuse says 22 million Americans have used cocaine at least once. Of these, 8.2 million have used it in the last year. Just 862,000 use it every week. That doesn't sound like a ferociously addictive drug.

When it comes to crack, a smokable form of cocaine which is allegedly more tenacious in its hold, no one knows exactly how many addicts there are. But NIDA says fewer than one in every five of the 2.5 million people who have tried it are regular users, blasting off at least once a month. Bennett's "epidemic" has afflicted no more than one American in every 500.

Crack is supposed to be uniquely destructive because of the severe damage it does to fetuses. Propagandists for the drug war claim that 375,000 "crack babies" are born every year, requiring billions of dollars in extra medical care. But the government says there are fewer than half a million people who smoke crack regularly. Apparently we're supposed to believe that four out of every five of them give birth each year.

In fact, despite being cheap and widely available, crack hasn't produced mass addiction. Why not?

The best explanation comes from Dartmouth neuroscientist Michael Gazzaniga in a recent interview in National Review magazine. Only a small portion of the population is inclined to abuse drugs (including alcohol), and these people will systematically wreck themselves with whatever is at hand, he says. But those who aren't prone to abuse won't become addicts regardless of what drugs are legally available.

"In our culture alone," said Gazzaniga, "70 percent to 80 percent of us use alcohol, and the abuse rate is now estimated at 5 percent to 6 percent. We see at work here a major feature of the human response to drug availability, namely, the inclination to moderation." People allowed to make free choices generally make sound ones.

But a recognition that humans can use freedom wisely is not one of the distinguishing traits of those behind the drug war who can imagine all sorts of costs from legalization but can't see the real ones from prohibition. If the citizenry ever emerges from the haze produced by the drug war, it may realize that the greatest harms are the ones we've already got.

2.

**Drug Legalization: Asking for Trouble**[20]
by Robert L. DuPont and Ronald L. Goldfarb

The world's most reasonable-sounding but dumb idea is the one that advocates solving the country's drug problem by legalizing drugs.

Its fundamental flaw is the premise that the drug problem is not one of drug use but of drug prohibition. The reality is otherwise: drug use is the core drug problem. Legalization cures the problem of prohibition at the cost of more drug use.

Legalization advocates emphasize the high cost of maintaining the prohibition of such drugs as marijuana, cocaine, PCP and heroin. The costs of prohibition are high and rising. But the debates about legalization generally overlook the costs attributed to drug use itself in the lost potential and the lost lives. A few people die now in America because they cannot get drugs cheaply. Far more die and suffer because they can, despite prohibition. Fourteen million Americans now pay $100 billion a year for illicit drugs. How many more Americans would consume how much more if drug prices were cut by 90 percent or more as the legalization advocates propose?

The litmus test of any legalization plan is what to do with dangerous drugs such as crack and PCP. Crack, or smokable cocaine, is the only drug problem that is getting worse in the United States. Legalizing limited use of small quantities of marijuana or giving IV drug users sterile needles will not dent the crack problem.

Watch what happens when you ask advocates of legalization how their scheme would work: they turn silent, or they talk about how bad prohibition is. Which drugs would be legalized, in what forms, at what potencies and for whom? Imagine your junior high school- or college-age son or daughter, or your neighbor, dropping into the local, government-run package store. "A packet of crack, please, some PCP for my date and a little heroin for the weekend."

"Yes, sir. Will that be cash or charge?"

Some legalizers have talked about doctors writing prescriptions for legalized cocaine, heroin or other drugs. This idea is ridiculous. Doctors don't and shouldn't write prescriptions for chemical parties.

Drug abuse treatment, both public and private, is expensive and a growth industry because of the national drug epidemic,

20. © *The Washington Post,* 1990. Robert L. DuPont, a psychiatrist, has directed the National Institute on Drug Abuse. Ronald L. Goldfarb is a former Justice Department prosecutor.

not because of drug prohibition. Using drugs such as methadone in the treatment of heroin addiction is a far cry from legalization, because methadone is only available in tightly controlled settings and only for therapeutic purposes. This fits with the long-standing U.S. approach, which allows dependence-producing substances to be used in medical practice to treat diseases but not outside medical settings and not for recreational purposes.

Advocates of legalization point to the "failure" of Prohibition. But during Prohibition—of manufacture, not use, of alcohol—consumption did decline drastically, and alcohol-related arrests dropped by half. Thus, laws do cut drug consumption, prevent new users and decrease casualties. Correctly or not, society seems to have made a costly, special deal with recreational drinking.

The most recent National Institute on Drug Abuse survey of Americans over the age of 12 showed that in 1988 there were 106 million alcohol users, 57 million cigarette smokers, but only 12 million users of marijuana and 3 million users of cocaine. All four numbers were down from 1985 levels. Alcohol use dropped 6 percent, cigarette use dropped 5 percent, marijuana use dropped 33 percent, and cocaine use dropped 50 percent. It is not easy to look at these numbers and conclude that prohibition of illegal drugs is not working to reduce use or that we are losing the war on drugs.

The best way to cut the drug market is to decrease society's tolerance for illicit drug use. That means creating painful consequences for illicit drug use to help the non-user stay clean. There need to be more and better programs to help the current drug users get clean. This country needs less debate on the legalization of drugs and more discussion about how best to deter drug users and provide drug treatment.

Law enforcement aimed at the supply of drugs is an important but small part of the solution. We do not believe that the drug problem will be solved by criminal sanction. No social problems are. We agree with the Harlem barbershop owner who said the idea that jails stop drugs is "like saying cemeteries stop death." Along with deterring use and punishing sales, we also must learn more about causes and prevention of drug use.

The battle to end the drug abuse epidemic is likely to be won or lost in families and neighborhoods, in workplaces and schools. Do we, individually and collectively, tolerate or do we reject illicit drug use? The debate about legalization simply delays the important commitment to reject the use of illicit drugs. It also demoralizes the people most committed to ending the drug problem by raising questions about national support for their vital efforts.

Debating legalization is a dangerous delusion. Why now,

when only a few months ago the federal government released new statistics that showed a 37 percent decline in the regular use of illicit drugs in America, a fall that included every region in the nation, all races, both sexes and all social classes? With that sort of progress in the war on drugs, this is a particularly odd time to give up a battle.

The problem with drugs is drug use. Every proposed reform that makes drugs more available or acceptable is going to increase drug use. It would also increase the suffering and unhappiness that flows from drug use for both users and non-users of drugs.

## Exercise 10.5 Putting It Together in the Classroom: "Fishbowl" Discussions and Critical Exchanges

### 1. "Fishbowl" Discussions: Modeling Critical Reasoning

This is a group exercise for the classroom. Its objective is to provide practice for using critical reasoning techniques in everyday discussions.

First, generate a short list of topics that students have actually been discussing recently with their peers, outside of class. From this list, pick a topic of interest to the class. Next, a few students who have discussed this issue should describe how the discussions have gone, recounting as much detail as possible.

At this point, arrange the chairs in the classroom so that all chairs face the middle of the room, with two chairs in the center, facing each other. This is where the students in the "fishbowl" will sit. Two students should be selected to act out one of the discussions that have been described.

The next step is for those who have observed the discussion to comment on to what extent the dialogue represented good critical reasoning. Students who have ideas about how the dialogue might have been improved can now take the places of those in the fishbowl, with each participant initially taking the position of the person he or she has replaced. This process of replacing participants can be repeated.

The exercise can be concluded with comments from the observers concerning which strategies appeared to be most helpful in facilitating the discussion.

### 2. Participating in a Critical Exchange

A good exercise for displaying your reasoning skills orally, rather than in writing, is a structured, critical exchange on an important issue such as whether a

woman should have the right to have an abortion, whether capital punishment is ever justified, whether casual sexual relationships are worth pursuing, whether a woman should take her husband's name when she marries, or whether drugs should be legalized.

A structured, critical exchange is similar to a formal debate, except for a few crucial features. Most important, the object is not to win but to join with those participating in the exchange to determine what position is most reasonable to hold regarding the issue in question. To build this goal into the structure of the exchange, a period of time should be allowed, after the participants take an advocacy role on one side of the issue or the other, for each person to explain where she or he really stands on the issue, having considered all the arguments and criticisms raised.

In addition, the arguments presented should be developed cooperatively in advance of the presentation of the exchange, so that the participants representing each side can help make all the arguments (including those they will be criticizing) as strong and worthy of consideration as possible.

Here is a format for a critical exchange involving four people that can be used in an hour-long class period and that allows time for questions and comments from the audience. The format incorporates the features mentioned above, which are aimed at minimizing competition and maximizing insight.

**Preparation for the Exchange**

1. Meet as a four-person team to decide on a topic. (You can use any of those listed above or another of interest to the team.)
2. Decide which two members will take the affirmative side and which two the negative side in presenting arguments on the issue. It is not necessary to take the side you feel initially inclined to support. Sometimes it is a better learning experience to argue for the other side.
3. After some brainstorming and background reading, the team should develop two arguments on the affirmative side and two arguments on the negative side. The arguments should be briefly stated and tightly structured, so that they can be written on the chalkboard or on a handout sheet for the audience.
4. As a team, discuss possible criticisms of the arguments. Obvious flaws in the arguments can be spotted at this time, and the arguments can be rewritten.

**Presentation of the Exchange**

1. *Affirmative team.* Each member takes about three minutes to present one argument in favor of the proposition being discussed. (An example of an argument might be: "A woman has the right to do whatever she wants

with her body. A fetus is a part of a pregnant woman's body. Therefore a woman has the right to have an abortion if she wants.")

Explain what is meant by each premise and why it is reasonable to believe that premise.

2. *Negative team*. Each member takes about three minutes to criticize the arguments that have been presented, applying the techniques of criticism learned in class.
3. *Negative team*. Each member presents an argument opposing the proposition in question (three minutes each).
4. *Affirmative team*. Each member criticizes the negative team's arguments (three minutes each).
5. *Concluding presentations*. Having considered all arguments and criticisms, each member states where she or he really stands on the issue. Replies to criticisms and additional reasons can be brought up at this time.
6. *Class comments*. Class members who have been listening to the exchange are allowed to make comments or address questions to the participants.

CHAPTER ELEVEN

# *Making Reasonable Decisions As an Amateur in a World of Specialists*

We will finish our investigation of critical reasoning by examining your role in society as an active reasoner and decision maker. To what extent should you develop this role, as opposed to relying on experts as sources of your opinions and decisions?

Our discussion of a variety of critical techniques in previous chapters might seem to promote the passive role of sitting back and critically judging rather than actively creating new arguments and theories. You have been told that a *sound deductive argument* demands true premises and that the knowledge necessary to establish these premises often requires specialized inquiry or technique, particularly when it depends on empirical theories. Given these suggestions, you might have lost confidence in your ability to make judgments yourself. You might be tempted to say: "In any area I pick to create arguments and theories, there are people who have much more knowledge and expertise than I. Why not just find out what opinions they hold and adopt them for my own? If I try to figure things out for myself, it is very likely that I will be wrong."

The idea of "leaving things to the experts" is tempting enough that we will spend some time exploring it. After all, given nearly any question you might have about any area of knowledge, there are probably people who have made this their area of specialization and who are better able to answer this question than you could ever hope to be. Unfortunately, we are faced with a serious dilemma. We need to understand the world, but we can't understand what the experts say about it. If we try to figure things out for ourselves, we are likely to be wrong. But if we

simply leave things to the experts without understanding their theories, we have difficulty in deciding who the experts are, in determining what to believe if the experts disagree, and in limiting the influence of experts to its proper domain.

This dilemma is extremely difficult to resolve; neither alternative is completely satisfactory. But we maintain that in the face of this difficulty it is important not to hide from the problem—not to take the view that it doesn't matter what you believe since all opinions are uncertain, or the view that to escape the uncertainty of rational processes it is necessary to rely on faith. It is crucial to continue to pursue reasonable belief, even if such belief is never certain, because belief is connected to *action*. Responsibility for our beliefs stems from responsibility for our actions.

When we say certain people are "experts," we are not assuming that society is divided into two groups—those who understand the world and the masses who do not. Even if you are an expert in one area, there are many other areas in which you are uninformed. We are not all equal in our general knowledge or in the breadth of our expertise, but for the purposes of this chapter we can consider each of us to be in the position of an amateur in a world of specialization.

## Leaving It to the Experts

What do you really know about nuclear energy, the balance of trade, or the most effective ways of combating crime? Chances are you have expressed opinions on some of these issues in casual conversation, and you probably think that some views on these issues are not correct (for example, there are no dangers involved in nuclear energy; a trade deficit—that is, buying more from abroad than we are selling—is good for the economy; crime will stop by itself). You are probably quick to acknowledge, however, that there are people who know more about these issues than you do. Why not, then, simply leave opinions on these matters to people who do know more—who have made it their business to learn all they can about areas such as these? You could say that for each issue on which you might need to express an opinion, you will just wait until the occasion arises and then try to find out what the experts think about it and adopt their advice. Surely you would then have a greater chance of being right about each issue than if you spread out your time trying to learn a little about everything; and by leaving things to the experts you will have more time to do the things you really enjoy. What could be more sensible?

Let us imagine that we have adopted this policy of leaving things to the experts. What problems might we encounter?

**Who Are the Experts?** Our first problem would be to determine who the experts are, so we could know whom to ask about the views we should adopt. Suppose the issue is how dangerous nuclear power plants are. As a starting point

we might go to various professors of physics and of engineering and ask them who the best experts are on this issue. If there were some consensus as to who the experts are, and these experts all had about the same story concerning the major risks in nuclear power plants and the extent to which these risks could be minimized, we would probably feel confident that our strategy of leaving it to the experts had been successful. But what might go wrong in this process?

We might pick the wrong fields of study in our search for experts. Perhaps the biggest risks involving nuclear power don't have to do with science and engineering, but with politics. Perhaps the technical problems of protecting against radiation leaks can be easily solved, but a revolutionary political group who wanted to gain power could get access to and control of nuclear power plants. How would we know this in advance when we began looking for experts? Perhaps the physicists and engineers we consulted would see the problem of political security and send us to the right experts on this part of the issue, but there is nothing to guarantee it. It is important to see that it would be helpful to know *something* about the dangers of nuclear power before we began looking for experts.

**What If the Experts Disagree?** Second, we have a problem if the experts themselves disagree. Suppose the issue is what to do about the trade deficit—what causes it and how it might be reduced. Since this is an economic issue, we would try to find out who the leading economists in the country are and consult them. As a matter of fact, the answers we would get on this issue would be particularly varied, but this issue is hardly unique. Suppose we get three different answers from three widely renowned economists. How do we decide what to believe? We can ask for reasons to support the varying points of view, but the reasons will probably be embedded in three different broad economic theories. We might need to learn the theories even to evaluate the particular views on the trade deficit.

Both of these problems—determining in which field an issue lies, and deciding among conflicting expert opinions—are related to a third, more difficult problem. If a supposed expert states a number of views on an issue, how can we tell which are based on expertise and which are based on personal political or moral preferences? That is, how do we prevent technical expertise from spreading into political power?

**How Can We Control the Influence of Experts?** Consider the issue of the most effective means of controlling crime. We might go to a famous criminologist who has carefully studied the variation in crime rates with different kinds of punishments, rehabilitation programs, police procedures, social conditions, and so on. But this criminologist also happens to believe that no one should ever be punished because all actions are socially caused and no one should be blamed for an act that is socially caused. Now this view about punishment is not based on criminological investigation; it just reflects our

"expert's" view about the way things should be. But on the basis of this political opinion, the criminologist might alter the answer given about the most efficient way to control crime, in trying to influence political opinion in a particular direction. We might have the same problem with physicists and engineers generally *wanting* nuclear power production, and some economists *wanting* to eliminate trade barriers with Japan because of views they hold about the desirability of, say, a free market economy. And in each case, by relying on expert opinion, we as a society might be setting experts up so that they have things the way they want them—no longer will they just be giving us factual advice and letting us decide how we want things to be.

**The *National Enquirer* Syndrome** The mentality of "leaving it to the experts" has further unhappy side effects. As the areas of expert knowledge become more specialized and more technical, the gap between the theories of experts and what the common person can understand becomes wider and wider. Many people lose contact entirely with the science of the day, and yet they want to understand why things happen. In this light, we can understand the immense popularity of newspapers like the *National Enquirer*. As you go through the checkout at the supermarket, where these tabloids are usually placed, notice the headlines. You might find that all the political assassinations in the past two decades were a result of a single conspiracy; that a recent disaster was caused by visitors from outer space; that some common substance can cure cancer; that supernatural forces caused a plane crash; and so on. The upshot of all these theories is that you can understand what happens in the world without understanding all of the complicated and technical theories of the "experts."

Although the tabloid readers have, in a sense, "left things to the experts," they have not deferred to the judgment of experts out of respect. Rather, they have *abandoned* any attempt to comprehend specialized, technical theories. In most cases, the *National Enquirer* type of explanation is either one that is very simple such as a single conspiracy accounting for many assassinations—or one that goes beyond science in a way that tells you: "You understand what is going on as well as anyone does, *because no one really understands*." That is, the "explanation" is supernatural; it has to do with ESP, demonic forces, and so on.

We doubt that many theories of the *National Enquirer* type would withstand the critical tests we discussed in the previous chapters. The contrast between these theories, which are so popular, and the sophisticated theories of modern science, which have become so inaccessible, is striking evidence of the problem of the amateur in a world of specialization.

## The Dilemma

The dilemma, then, is this: If we try to create our own arguments and theories without relying on experts, we will very likely be wrong. If we just leave things to the experts to figure out, thinking that we will adopt their opinions as our own, we have difficulty in knowing who the experts are, in deciding who is right when the experts disagree, and in controlling the influence of the experts on whom we rely. In addition, simply leaving things to the experts means neglecting the development of our own ideas, so that we may find we fall back on explanations of the *National Enquirer* type in our understanding of the world.

If, by adopting the opinions of experts, we came to understand all that the experts understand, our dilemma would be resolved. However, when we spoke of "leaving things to the experts" we assumed that no one really has the time, energy, and intellectual ability to actually acquire more than a tiny fraction of the knowledge needed to have expert opinions in all areas. In this age of specialization, it is a rare scholar who can keep up with the major developments in just one discipline such as psychology or physics. It is because of the rapid proliferation of knowledge that we run into the problems of determining who the experts are, resolving their disagreements, and so forth. We are forced to make these decisions in the absence of direct knowledge of the area in which we are seeking expert help.

How then are we to resolve this dilemma? Is some sort of compromise possible—a compromise between learning all that we can on our own and combining this with selective reliance on expert opinion? Are there particular strategies that might be used to control the influence of experts while still making use of their expertise? And how does all this relate to creating our own arguments and theories? Before addressing these questions, we should say a few words about certain attitudes that are easy to embrace in the face of the difficulties we have been discussing, but that we think are important to avoid.

## Two Ways of Not Facing the Dilemma

Some seek to avoid the dilemma by going to one of two extremes: the relativist view that one opinion is as good as another, or the absolutist view that a single doctrine contains the answer to everything.

**Relativism** A kind of disillusionment strikes many people as they come to realize how easily most opinions can be doubted. The fact that there is widespread disagreement, even among experts, on almost any issue of importance is

unsettling. Perhaps this situation is grounds for a kind of skepticism—that is, we should be guarded in our claims to knowledge, and realize how many of our beliefs are uncertain. But it is tempting to go from skepticism to a more extreme point of view: that one opinion is as good as another and it doesn't really matter what you believe. It simply doesn't follow from the fact that people disagree that no one's opinion is more reasonable. And even if we granted that all our beliefs are uncertain, it doesn't follow that all our beliefs are *equally* uncertain.

Often, the kind of absolute relativism to which we are objecting comes out when someone is challenged about the truth of an opinion. A common reply is that some things are "true for me," and other things are "true for you," but no one can say what is *really* true. This may be an appealing point of view as long as the discussion remains abstract. But most if not all of the particular opinions we hold have implications for how we should *act*. If you are riding in a car and you are of the opinion that it is heading for a cliff, but the driver doesn't share this opinion, it is doubtful that you will be satisfied to say that it is *true for you* that the car is headed for a cliff, but it isn't *true for the driver*, and that no one can tell what is really true in this case. Leaving aside questions of absolute certainty, one opinion is probably much more reasonable to hold than the other in this case, and it obviously makes a big difference which opinion you do hold. The consequences of many opinions are less direct and less drastic. But the fact that your beliefs determine your actions should be reason enough to reject the view that it doesn't really matter what you believe.

**The "True Believer"** A second attitude is also a commonly held reaction to the uncertainty of most opinions. This is the attitude of the "true believer," who wants some firm doctrine to hang onto, does not find it through ordinary rational processes, and turns instead to faith. It is typical of the true believer that the doctrine she picks is one that explains anything and everything. And once she has accepted it, she is blind to any weaknesses. Whether the doctrine is Marxism, religious fundamentalism, laissez-faire capitalism, or astrology, she holds it so ardently that no conceivable argument will diminish her belief. We are not claiming that a person who holds any of the beliefs just listed is irrational and is a "true believer." We are concerned about the *way* the true believer maintains her doctrine. Perhaps she will undergo some personal change that will make her suddenly withdraw her faith in one doctrine and put it equally wholeheartedly into another, but this will not be the result of hearing a good argument.

Two tendencies, both partly the result of the difficult situation of the amateur in a world of specialization, contribute to the true believer syndrome. One is an insecurity resulting from the tentative nature of belief based on science. With experts disagreeing, one theory succeeding another, and most theories only partly understandable by the average person, many people feel they lack a satisfying system of beliefs. It is comforting to put your faith in a single, understandable

doctrine that will explain a great many things and will tell you where you stand in the scheme of things. But the fact that such a doctrine is comforting is not evidence that it is true.

The second tendency that contributes to the true believer syndrome is the tendency to see faith as parallel to and in competition with reason. This idea is especially attractive to the religious dogmatist who sees the uncertainty of belief, which we have been discussing, as a weakness of reason, a weakness that can be remedied by choosing faith instead. We do not maintain that faith has no justifiable role in our lives, but it is a mistake to see faith and reason as competing paths to knowledge. The true believer who sees faith as her path to knowledge is at a loss to answer one crucial question: Why have faith in one doctrine rather than another? The answer cannot be produced from within faith itself, it *must* be produced from within reason. Or if it isn't, it must be granted that the decision is arbitrary. It is not as though reason might choose one set of beliefs and faith another; faith does not choose.

Furthermore, the same point can be made against the true believer as was made against the relativist: Your beliefs form the basis for action, and as such you have a responsibility to choose them reasonably. Both relativism and the true believer syndrome may be *understandable* reactions to the dilemma of the amateur in a world of specialization, but this does not make them justifiable reactions.

## Coping with the Dilemma

The first part of the dilemma we have presented is that if you try to figure things out for yourself you will probably be mistaken. Let's explore this half of the dilemma first, to see whether some of the problems associated with such a course can be remedied.

When we spoke loosely about "figuring things out for yourself," we had in mind developing your own arguments and theories. We did not suppose you would do this in a vacuum, with no help from other people and their writings. But even with this help, the arguments and theories you would develop are likely to be inadequate compared with those of experts in the different fields.

Even if your arguments and theories are inferior to those of experts, however, what is wrong with developing these inadequate opinions? The main drawback is that your opinions form the basis for actions, so you want to acquire opinions with the greatest chance of being correct. But is it necessary for us to use the opinions we develop on our own as a basis for action? Can't we develop our own arguments and theories, and maintain them tentatively, allowing them to be overridden by expert opinion when we decide that this is wise?

**Developing Opinions Without Acting on Them** Consider some examples. Suppose you were to read and think about physical health and how it should be maintained. You might adopt some theories of nutrition that you read about and came to understand; you might develop some opinions about exercise, based both on the theories of others and on your own experience and experimentation. You might form some ideas concerning your own ailments—what causes them and how they should be treated. You could do all this and yet, when it came to diagnosing a certain ailment and providing treatment for it, you could decide to let one of your own beliefs be overridden by that of a doctor.

Suppose you read and thought about certain questions in the field of economics. You might read magazine articles on the nation's economy, discuss economic questions with other people, take a course or two in economics at a university, read some books in the area. You could come to understand and adopt certain theories you read or heard about, and you could develop certain variations of these theories yourself. You might acquire your own unique overview of economics, while hardly considering yourself an expert. And throughout this development of your own ideas, you would probably remain ready to defer to someone you thought knew more about a certain issue than you did. If it came to giving investment advice, or even to voting for a political candidate who held an economic ideology different from yours, you might put your own opinions aside in favor of an expert's.

It seems clear, then, that it is possible to develop your own opinions in any area and still refrain from acting on them. But what would be gained from doing so? Is there a way we can fit this possibility into a strategy for coping with the dilemma that confronts us?

**A Proposed Strategy** There are two things to be gained from developing your own opinions, even though you probably won't act on them. First, self-realization is important to anyone. And developing your own ideas, your own understanding of the world, is an important part of self-realization. There is a satisfaction—a feeling of autonomy—in taking the task of understanding the world into your own hands. This does not mean shutting out the opinions of others, but it means actively engaging in understanding rather than being a passive receptacle for opinion. In the process, you will develop your mental abilities more fully.

Second, you reduce the problems involved in relying on experts. This point brings us, now, to what we see as the best strategy for coping with the dilemma of leaving things to the experts or figuring them out for ourselves. The strategy is to combine both practices. This is not a complete resolution of the dilemma because it leaves problems unsolved. But it does allow for self-realization while *reducing* the problems that arise from leaving things to the experts.

The more understanding you have, the better chance you have of minimizing the problems involved in relying on experts. The three major problems we

anticipated were determining who the experts are, deciding what to do when the experts disagree, and controlling the influence of experts. Of these, the problem of disagreement among experts is probably the most difficult to overcome by gaining a limited understanding of the area in question.

## Still a Problem: The Disagreement of Experts

When experts disagree, considerations beyond the credibility of the competing opinions may give us grounds for making a choice. If one physician advises that you have an operation but a second physician advises against it, there is an obvious reason for accepting the second opinion. It may also be possible to test competing opinions by putting each into practice for a trial period. A president, for example, might try one economic policy for a certain period and then shift to another. But the results of such trials are often difficult for the amateur to assess and there is not always time to experiment. Furthermore, a disagreement among experts may be such that you would need to understand both competing theories as well as the experts themselves do in order to make a reasoned choice between them. The other two problems, however, do not seem so intractable.

## Creating Arguments and Theories and Determining Who the Experts Are

One fringe benefit of creating your own arguments and theories is that in the process of gaining background knowledge on which to base them, you can become acquainted with a large number of areas. You can begin to understand how various academic disciplines, professions, and specialized occupations deal with the different sciences and their branches. This is precisely the kind of knowledge that is crucial in the age of specialization. Furthermore, by actually developing arguments and theories, you have a better chance of seeing the many different areas of expertise that apply to this issue.

There is a broad tendency to see generals as the experts on national defense issues, doctors as the experts on medical care issues, police chiefs as the experts on crime issues, and so on. In fact, all these issues have political, economic, and technological aspects that could be addressed by experts from dozens of fields. By attempting to develop your own ideas on these issues, you have a greater chance of seeing how diverse they are.

## Creating Arguments and Theories and Controlling the Experts

The point that many different areas of expertise usually apply to a single issue is important when it comes to determining how to control the influence of experts. This is one of the few considerations that should give amateurs confidence when comparing themselves to experts. Very often, no one is an expert when it comes to seeing how the expert opinions from various fields should all be brought together to form a policy. And this is precisely the point at which the influence of experts can and should be controlled. At this point, the amateur who has tried to create arguments and theories concerning a broad issue need not defer to someone who is an expert on only one facet of the issue.

Furthermore, the relation between certain areas of expertise and their application to real-world issues might be indirect. Many academic disciplines develop abstract, technical theories and models whose relation to the real world may be poorly understood even by experts within the discipline. It is too often assumed that any behaviorist psychologist can give you advice on child rearing, that an economist can help you with your investments, or even that a mathematical logician can help you evaluate an argument from a piece of informal prose.

It is important that you see as best you can the limitations of each area of supposed expertise. Experts themselves will not be anxious to limit their own influence—they might attempt to run a bluff, hoping that amateurs will be too meek to challenge them. The more you have adopted the habit of leaving things to the experts rather than developing your own arguments and theories, the greater the chance that such a bluff will succeed.

## How Does One Create Arguments and Theories?

One central topic we have not addressed is how to go about creating arguments and theories. We won't discuss the *mechanics* of creativity—this topic is more suitable to a psychological study, or perhaps a biographical study of creative individuals. Nevertheless, the critical procedures described in the foregoing chapters can be used as a starting point in creating arguments and theories.

**Criticizing and Creating** Criticizing and creating are not completely independent processes. One way of criticizing a theory is to see that an alternative theory is more plausible; this involves conjuring up, or creating, the alternative. When you reconstruct a fragmentary argument as a step toward criticizing it, devis-

ing missing premises requires creativity. When you ask whether a premise is doubtful or whether it is reasonable to believe, you create tentative arguments in an attempt to support it, and then critically assess these arguments.

Also, criticism is a part of a dialogue process that is, on the whole, creative. You consider arguments or theories presented to you, reject them in part or entirely, and reconsider new or altered versions. This process is like an artist experimenting with a design. The artist might change it around haphazardly, and by using a critical eye to reject all bad configurations, arrive at (create) an artistically good one. This model of creativity is not completely accurate, however. An artist need not try different designs entirely at random. He has a sort of guiding intuition, making it possible to picture in advance the way the design should look. Similarly, in creating an argument or explanation you do not sort through random lists of statements to be used as premises or as parts of a theory. A kind of intuition guides you in seeing what would be plausible candidates for premises or for theoretical statements. Criticism plays a role, although a limited one, by rejecting poor candidates.

Criticism, then, if it is carried out well, involves you to some extent in creative activity. It is possible, furthermore, to pursue this aspect of criticism consciously. As a way of getting started at devising a theory to explain something, or an argument to support a belief, study theories that have been offered to explain the same phenomenon, or arguments that attempt to support the same opinion. Critically assess these arguments and theories and cultivate the creative aspects of this critical process—seeking more plausible alternative explanations; refining and altering the premises that support the conclusions; or, if they cannot be made adequate, either choosing other premises or considering arguments for rejecting the conclusion. Even going this far will do a great deal to bring about the benefits of "figuring things out for yourself," rather than "leaving it to the experts."

## The Strategy and Its Prospects

The strategy we have recommended for the amateur in a world of specialization is one that combines creating your own arguments and theories with selectively and cautiously relying on experts. As we have stated, we are not entirely optimistic about the outcome of this strategy. The number of problems and issues to study and the number of areas of expertise to monitor are overwhelming. Perhaps it is possible to gain back a significant degree of control over experts who affect you most directly and personally—your doctor, your mechanic. But the social effects that a single individual can have by carrying out this strategy are practically negligible. What must be hoped for, as specialization increases, is an increased intellectual activism on the part of a significant portion of the population.

But this point—that one person can't do much to guard against the dangers of relying on experts—brings into focus an aspect of our dilemma about which we have said very little so far. That is, the dilemma we have presented is not simply that of a single individual who wonders how to best attain knowledge. Neither, however, is it a matter of bringing together the knowledge of all the individuals of society. There is no repository for such an aggregation—society as a whole has no mind. If there were such a collective repository, it would be easy to combine the opinions of many experts to form a more complete and adequate body of knowledge than that which any single individual possesses. But in reality, each person must try to combine the opinions of experts from a position of relative ignorance. We each must to some extent guess which experts to trust. The problem becomes in part political—that is, power and influence become issues. How can each of us muster a picture of the world that has the best chance of accuracy, but that is also not biased in favor of the personal preferences of experts?

## The Contemporary Problem of Knowledge

Through much of history, the problem of knowledge and the problem of the good society have been dealt with separately. A division of philosophy called *epistemology* attempts to answer the question of what knowledge is and how it can be attained. Political philosophy and social philosophy, on the other hand, deal with such problems as: How can a group of individuals combine to form a good or just society? In the modern world of specialization, the problem of how to attain knowledge becomes in part a social one.

In ancient philosophy, for example, Plato's *Republic* stresses the connection between knowledge and the "good society." For him, true belief and knowledge could be ranked in levels depending in part on how specialized they were. A technician who assembled an electronic listening device (a "bug"), for instance, would have more limited and specialized information than the electrical engineer who designed it and who could compare it with other devices having a similar function.[1] For Plato, knowledge about what might have counted as a "good" electronic listening device would not have been restricted to electrical engineering. An essential, more general question would have to be asked about whether, or in what form, such a device would exist in a good society.

Similarly, a "good computer" or a "good nuclear power plant" or a "good space station" would be ones that would exist in a good society. We are not accustomed to asking this general question about most of the objects, institutions, and

1. Plato saw the "craftsman" as having only limited skills; thus, technicians need retraining for each new project.

policies that confront us. We don't typically move from a discussion about what is a good car (for us or for U.S. car manufacturers) to questions about whether a transportation system relying on the private auto is part of a good society. The problem, of course, with such a move is that it raises the difficult question of how to gain knowledge about the "good society."

Plato solved the dilemma by envisioning a class of superspecialists who sought knowledge about the good society. In the society Plato describes, knowledge was concentrated in a few individuals, and ruling was included among the specialized roles. In contemporary society, knowledge is at best spread among many specialists, and no one specializes in ruling—at least that is not seen as the ideal. Specialization, however, is compromised by an attempt at democracy. To put it pessimistically: for Plato, a few had knowledge and they would rule; for us, no one has very much knowledge, but everyone must try to rule.

It is doubtful that many of us would want to transform our society into the one Plato envisioned. It is difficult for us to part with the ideal of democracy, and we are justifiably suspicious of the "knowledge" of those who would rule. But to give our society the best chance of persisting, we must cope with its problems. Not the least of these is the problem of reasoning as well as we can from limited perspectives as amateurs in a world of specialization—reasoning both critically and creatively.

## Exercise 11.1 Case Study for Individual Writing Exercise or Group Discussion

How would you resolve the dilemma of whether to rely on experts or to figure out for yourself what to do if you faced the following situation? You are raising a child who begins to have severe behavioral problems, such as frequent temper tantrums, refusal to follow instructions at school or at home, and fighting with other children. Would you seek expert advice? From whom? What if you get conflicting advice from two sources? How would you be able to tell whether the person advising you is manipulating you for his or her own ends, rather than helping you decide what is best for the child and you?

# *Glossary*

***Ad Baculum*** ("To the stick") *See* Appeal to Force.

***Ad Hominem*** ("To the person") *See* Attacking the Person.

***Ad Misericordiam*** ("To misery") *See* Appeal to Pity.

**Affirming the Consequent** Any argument that exhibits the following *invalid* pattern:

*(1) If A, then B.*

*(2) B.*

*∴ A.*

**Ambiguity** A term in a context is ambiguous if it has more than one relatively distinct meaning in that context.

**Analogical Reasoning** Reasoning that justifies the claim that an item has a certain characteristic by appeal to a sufficiently similar (analogous) item, which is known to have the characteristic in question.

**Appeal to Authority** Appealing to someone whose expertise is not relevant to the issue at hand, or appealing to someone who is famous or admired but not an expert on the issue at hand. (*Note:* We have just described fallacious appeals to authority. There are also *legitimate* appeals to authority—appeals to people who really are experts in the appropriate areas.)

**Appeal to Force** The arguer tries to get you to agree by indicating that *you* will be harmed if you don't agree *(ad baculum)*.

**Appeal to Pity** The arguer tries to get you to agree by indicating that *he or she* will be harmed if you don't agree *(ad misericordiam)*.

**Argument** A structured piece of discourse in which a certain statement can be picked out as a conclusion and others can be picked out as premises that provide reasons for believing the conclusion.

**Attacking the Person** Arguing that a person's point of view should be doubted because the person has bad traits of character or because the person has something to gain by being believed. (*Note:* There are *legitimate* as well as *fallacious* cases of attacking the person.)

**Begging the Question** An argument that rests on a premise that is either a restatement of the conclusion or that would be doubted for the same reasons that the conclusion would be doubted *(petitio principii).*

**Causal Reasoning** Reasoning that typically moves from the observation that one thing is correlated with another to the claim that the first causes the second. Such reasoning is not always justified and is best supported by controlled experiments.

**Charitable Interpretation Principle** Maxim for interpreting argumentative passages that enjoins you to give the arguer the "benefit of the doubt" if at all plausible. If you have a choice, interpret a passage so as to have the premises provide the best support possible for the conclusion. Sometimes an argument as presented is faulty—for example, invalid or unsound—in which case a charitable reconstruction would leave it faulty in this way. (*See* chapter 2.)

**Conceptual Theory** A statement of the conditions under which a certain concept applies to an object. These theories are most plausible in domains in which clear boundaries can be drawn at least for some purposes. These theories are typically criticized by finding counterexamples and pointing to the need for a more extensive and illuminating statement of conditions. (*See* chapter 7.)

**Conditional** A statement of the "if-then" form, represented by "A $\rightarrow$ B" in formal language. The "if" part is called the *antecedent* or condition; the "then" part is called the *consequent.* (*See* chapters 4 and 5.)

**Confound** In a causal argument, the X-factor that might be the actual cause. Controlled experiments help rule out confounds. (*See* chapter 8.)

**Conjunction** A statement of the "and" form that links two other statements. It is represented by "&" in formal language. (*See* chapter 5.)

**Consistency** A group of statements is consistent if it is possible for all of them to be true at the same time. If it is impossible for all of them to be true simultaneously, then the statements are inconsistent.

**Contradiction** A statement that cannot (logically) be true. It is inconsistent in all contexts. Often used of statements having the form "A and not A," where "A" stands for a sentence, or the form "*m* is $P_1$, and *m* is not $P_1$," where $P_1$ is a predicate.

**Controlled Experiment** An experiment designed to determine whether one thing causes another that helps rule out the X-factor as an alternative explanation. It involves comparing an experimental group to which the suspected causal agent is applied, to a control group to which it is not, all other conditions being the same. If assignment to the groups is unbiased (random), then any significant difference in the experimental groups can be attributed to the suspected causal agent. (*See* chapter 8.)

**Convergent Argument** An argument in which independent (non-linked) premises are offered in support of the conclusion and give weight to it. More complex forms may contain both pro-considerations (in support of the conclusion) as well as counter- or con-considerations. (*See* chapter 8.)

**Correlation** The association of two or more characteristics or events. That two events are correlated—that is, they typically occur together—does not in itself justify the conclusion that the first causes the second. (*See* chapter 9.)

**Counter-Consideration** In a convergent argument, considerations weighing against the conclusion. (*See* chapter 8.)

**Counterexample** In a deductive argument, a counterexample is a clear case in which the premises are all true and the conclusion is false. It can be an argument that shares the same pattern as one in question, or, for an argument pattern itself, it can be a truth table assignment or a Venn diagram configuration. (*See* chapters 4 and 5.) For a conceptual theory, a counterexample either clearly fits the concept but not the conditions of the theory, or it fits the conditions of the theory but not the concept. (*See* chapter 7.)

**Counterinstance** In common usage, this term is interchangeable with *counterexample.* In chapter 8, we use it to denote an exception to an empirical generalization.

**Critical Reasoning** In contrast to mere disagreement, a procedure for understanding and evaluating the support given for a point of view.

**Deductive Argument** An argument in which the premises are put forward to guarantee the truth of the conclusion in the strong sense that it is *"logically" impossible* for the premises all to be true and the conclusion to be false.

**Denying the Antecedent** Any argument that exhibits the following *invalid* pattern:

*(1) If A, then B.*

*(2) Not A.*

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*∴ Not B.*

**Disagreement** Mere disagreement takes place when people assert opposing points of view without being open to having their minds changed by reasons. Each seeks to maintain a prior set of beliefs. This contrasts with a dispute subject to critical reasoning. (*See* chapter 1.)

**Disjunction** A statement of the "or" form, which is represented by "∨" in a formal language. (*See* chapter 5.)

**Distraction Fallacy** The general category of fallacies that tend to persuade by taking the audience's attention away from weak points of an argument. (*See* chapter 6.)

**Elucidation** A criterion for evaluating conceptual theories. A conceptual theory can be criticized by showing that it uses terms that are no easier to understand than the concept supposedly being clarified (that is, the theory fails to elucidate). (*See* chapter 7.)

**Emotion Fallacies** The general category of fallacies that tend to persuade by making it desirable to believe an argument's conclusion rather than giving evidence to support it. (*See* chapter 6.)

**Empirical Theory** A set of statements of fairly broad scope that explains patterns or regularities more easily established by observation. The theory is only indirectly supported by observation. Empirical theories can be criticized by pointing out that expected regularities, predictions, or patterns do not occur or are questionable; that there is lack of evidence that required regularities do occur; that crucial concepts in the theory cannot be tested; or by offering a rival theory that is more plausible.

**Epistemology** The philosophical study of the nature and conditions of knowledge.

**Equivocation** An argument in which an expression shifts its meaning from one premise to another, making the pattern invalid. Equivocation can exploit either ambiguity (more than one relatively distinct meaning) or vagueness (unclear boundary between objects to which the term applies and objects to which it does not).

**Expertise** Specialized knowledge in a restricted domain. Expertise is difficult to locate and dangerous to blindly pursue. The amateur—the nonexpert—needs to be able to reason critically to be able to use expertise when and where it is appropriate. (*See* chapter 11.)

**Explanation** An attempt to indicate why or how something occurred rather than to justify our belief that it did.

**Fallacy** An argument that tends to persuade us even though it is faulty and should not do so. Some fallacies involve a move akin to sleight-of-hand techniques used by magicians. Others tend to persuade because they put a motive for believing in place of support. (*See* chapters 6 and 8.)

**False Dilemma** The arguer claims that there are only two alternatives and one is unacceptable, so we should choose the other. But in fact, there are more alternatives than two.

**Generalization** A statement that applies to some number of individuals rather than to a particular case. (*See* chapter 8.)

*Empirical Generalization* A generalization purporting to be based on empirical observation or induction.

*Statistical Generalization* A generalization that applies to some, a few, or a certain percentage of cases.

*Universal Generalization* A generalization that applies to all cases. A universal positive generalization contains words such as *all* or *every,* as for example in "All animals with hearts have kidneys" and "Everybody will be famous for at least fifteen minutes." A universal negative generalization uses terms such as *no* or *none* to indicate that all cases do not have a characteristic. An example is "No one lives forever," which means "Everyone does not live forever."

**General-to-Particular Reasoning** Nondeductive, inductive reasoning that moves from "statistical" premises, including those using words like *most,* to a conclusion about a particular item. *See* Statistical Premise Argument.

**Hasty Generalization** Embracing a generalization on the basis of an unrepresentative sample, either too small or selected in a biased way.

**Implicit Premise** An unstated premise. We determine that such a premise should be added to the reconstruction of an argument in accordance with the Principle of Charitable Interpretation. Typically, such a premise is needed to render the argument deductively valid.

**Inconsistency** A set of statements is inconsistent if it is impossible for all of them to be true simultaneously.

**Inductive Argument** An argument in which the premises are put forward to make the conclusion likely or probable but not logically guaranteed. A sampling argument is the classical example, though arguments with statistical premises can also be considered inductive.

**Linked Argument** A deductive argument in contrast to convergent argument. The name suggests the logical links that connect all the premises with the conclusion.

**Mere Disagreement** A difference of opinion in circumstances in which participants do not engage in reasoned criticism.

**Misleading Definition** A case in which an unclear expression is given an "unusual" or technical meaning in the premises of an argument but where that peculiarity is not marked by qualifications or hedges in the conclusion.

***Modus Ponens*** (Mode of affirming) A common, valid argument form in which we "affirm the antecedent" of a conditional (that is, if-then) statement. It should be clearly distinguished from the similar but invalid argument form called the "fallacy of denying the antecedent." *Modus ponens* is exhibited by this pattern:

*(1) If A, then B.*

*(2) A.*

*∴ B.*

***Modus Tollens*** (Mode of denying) A common, valid argument form in which we "deny the consequent" of a conditional (that is, if-then) statement. It should be clearly distinguished from the similar but invalid argument form called "affirming the consequent." *Modus tollens* is exhibited by this pattern:

*(1) If A, then B.*

*(2) Not B.*

*∴ Not A.*

**Necessity** What must occur; the opposite of which is *impossible* or can't be. The conclusion of a valid deductive argument follows with necessity. It is impossible for all the premises to be true and the conclusion to be false. A statement is *logically necessary* if its denial leads to a contradiction (a contradiction describes an impossible situation). Something is *physically necessary* in a situation if it is physically impossible for it not to happen.

**Negation** A sentence of the "not" form, which is represented by "¬" in formal language.

**Nondeductive Argument** An argument in which the premises are not put forward to logically guarantee the truth of the premises. Inductive arguments are one form of nondeductive arguments.

**Non Sequitur** The conclusion does not follow from premises though it purports to.

**Particular-to-General Reasoning** A type of nondeductive, inductive argument that typically moves from evidence about particulars (for example, evidence collected through sampling) to conclusions about a larger population. This type of reasoning is most commonly called *inductive. See* Sampling Argument.

**Persuasiveness** *Legitimate* persuasiveness is a criterion of success for an argument. A legitimately persuasive argument has premises that the audience can understand and will be inclined to believe. Fallacious arguments, by contrast, are persuasive due to tricks and gimmicks.

***Petitio Principii*** ("Petitioning the premises") *See* Begging the Question.

***Post Hoc, Ergo Propter Hoc*** ("After this, therefore because of this") The fallacious or unjustified move from correlation to cause. (*See* chapter 8.)

**Prejudicial Language** The arguer uses language that biases you in favor of his or her position or against an opponent's position without giving evidence for his or her position or against the opponent's position.

**Principle of Charitable Interpretation** *See* Charitable Interpretation Principle.

**Quantifier** A symbol in a formal language used to represent the "quantity" to which a sentence applies. The universal quantifier (x) is used to formalize statements containing *all, every,* and related terms. It can be roughly translated "for all." The existential quantifier, (∃x), means roughly "There exists at least one thing such that" and is used to translate statements containing the term *some.* (*See* chapter 5.)

**Reconstruction** Reformulation of arguments, conceptual theories, or empirical theories that makes their structure clearer. This can include making explicit elements that are only implicit in the original presentation. Such a reconstruction puts an argument or theory in *standard form*. (*See* chapters 3, 7, 8, and 9.)

***Reductio ad Absurdum*** ("Reducing to the absurd") A technique of indirect proof that justifies a statement by showing that its negation leads to a contradiction (more broadly, to an absurdity). (*See* chapter 5.)

**Regularity** A less theoretical, more observational statement that describes a pattern to be explained by a broader empirical theory. (*See* chapter 9.)

**Relativism** The belief that one opinion is always as good as another, and that when two people disagree, it can never be determined whose position is more reasonable to hold.

**Representativeness of a Sample** A sample is likely to be representative (similar to) a population from which it is drawn if it is sufficiently large and drawn in an unbiased manner. (*See* chapter 8.)

**Requirement of Total Evidence** In an inductive argument with statistical premises, the expectation that all available, relevant evidence will be included in picking relevant premises. (*See* chapter 8.)

**Resemblance Fallacy** The general category of fallacies that tend to persuade by resembling good arguments. (*See* chapter 6.)

**Sample** A selection of cases from a population. In particular-to-general inductive reasoning, statements about a sample are used as reasons to justify similar statements about the whole population from which the sample is drawn. If the sample is likely to be unrepresentative, too small, or biased, then the reasoning can be criticized. A random sample of sufficient size improves such inductive reasoning. (*See* chapter 8.)

**Sampling Argument** A particular-to-general inductive argument.

**Slippery Slope** The arguer says we shouldn't do something, because it probably leads to something else, which leads to a third thing, and so forth down the "slippery slope" to a final consequence that is clearly undesirable. But in fact some of these steps are implausible.

**Sound Argument** A valid deductive argument with only true premises. In such an argument the conclusion follows, all premises are true, and hence the conclusion is true as well.

**Standard Form** For a deductive argument, standard form consists of a numbered listing of premises, separated by a line from a statement of the conclusion prefaced by the symbol meaning "therefore" (∴). For inductive arguments, the symbol for "therefore" is replaced by the term *likely.* For conceptual theories, standard form has an underlined designation of the concept to be defined followed by "if and only if," followed by the condition(s) of the conceptual theory. For an empirical theory, standard form consists of a list of separate theoretical statements, regularities, or patterns, and any observational support.

**Statistical Premise Argument** A general-to-particular inductive argument that includes statistical premises in which some unspecific statistical terms such as *many, most, a few, seldom,* and so on are used, or some specific percentage is mentioned. *See* Statistical Syllogism.

**Statistical Significance** Properties true of a sample are likely to be true of the population from which it is drawn. But a difference detected in a sample, between say an experimental group and a control group, can be *statistically significant* without being scientifically or policy significant. If a sample is large enough, even very small differences could be statistically significant.

**Statistical Syllogism** A version of the argument from statistical premises having the following form. (*See* chapter 8.)

| | | |
|---|---|---|
| *(1) Most $P_1$'s are $P_2$'s.* | | *(1) N% $P_1$'s are $P_2$'s.* |
| *(2) m is a $P_1$.* | *or* | *(2) m is a $P_1$.* |
| *(likely) m is a $P_2$.* | | *(N% likely) m is a $P_2$.* |

**Straw Man** The arguer makes a position appear strong by making the opposing position appear weaker than it really is. The arguer puts a weak argument in an opponent's mouth when stronger arguments are available.

**Subordinate Conclusion** In the reconstruction of a complex deductive argument, the conclusion of one argument that serves as a premise in another.

**Successfulness** A deductive argument is successful if it is valid (that is, the conclusion follows), has true premises, and is legitimately persuasive. An inductive argument is successful if its premises make the conclusion likely, its premises are true, and it is legitimately persuasive.

**Theory** *See* Conceptual Theory or Empirical Theory.

**Truth Table** A way to systematically indicate possible assignments of truth values to initial statements and to display the truth value of more complex statements constructed out of them using logical connections. It provides a way to systematically search for counterexamples that might show an argument to be invalid. An argument that can be represented on a truth table is valid just in case there is no line in which the truth value, for all the premises, is true (T) and that for the conclusion is false (F). (*See* chapter 5.)

**Vagueness** A term is vague in a context if it is unclear where to draw the boundary between things to which the term does apply and those to which it does not.

**Validity** A deductive argument is valid if and only if it is impossible for all the premises to be true and the conclusion to be false. (*See* chapters 4 and 5.) There is no counterexample showing that the premises are true and the conclusion is false. Truth tables or Venn diagrams can be used to determine validity for some arguments. (*See* chapter 5.) In inductive reasoning, "internal validity" exists when threats to it have been eliminated using random assignment or other means. (*See* chapter 8.)

**Venn Diagram** A way of representing simple predicate arguments using overlapping circles to designate the set of objects to which the predicate applies. The technique is useful in assessing validity and finding counterexamples to certain simple arguments that contain quantifiers. (*See* chapter 5.)

**X-Factor** In a causal argument, the confounding factor that might vary with a supposed cause and actually be the cause. Controlled experiments try to rule out these confounds. (*See* chapter 8.)

# *Answers to Selected Exercises*

## Chapter 1

**Exercise 1.2 (pp. 12–18)**

(Wording of answers will vary.)

1a. MAIN POINT: America needs to keep good-paying jobs in the country.

SUPPORTING CLAIMS: America has got to narrow the gap between the very wealthy and the rest of us. We can narrow the gap only if we keep good-paying jobs in the country.

1c. MAIN POINT: We should not judge political candidates by their position on the single issue of abortion.

SUPPORTING CLAIMS: Other issues on which candidates differ are more important to the fate of the country.

## Chapter 2

**Exercise 2.1 (pp. 25–28)**

1. *(1) Any friend of mine deserves my respect.*
   *(2) Ed is a friend of mine.*

   *∴ Ed deserves my respect.*

(We have put 3–15 into standard form, rather than circling and labeling.)

3. *(1) If your mind were organized, your desk would be organized.*
   *(2) Your desk isn't organized.*

   ---

   *∴ Your mind isn't organized.*

5. *(1) An activity pays if the people who engage in it come out ahead economically more often than not.*
   *(2) The people who engage in many crimes come out ahead economically more often than not.*

   ---

   *∴ Many crimes pay.*

7. *(1) If a murderer is wrong in killing his victim, then society is also wrong in killing the murderer.*
   *(2) A murderer is wrong in killing his victim.*

   ---

   *∴ It is wrong for society to kill a murderer.*

9. *(1) If private enterprise does better than government at running businesses, then it will do better at running schools.*
   *(2) Private enterprise does better at running businesses.*

   ---

   *∴ Private enterprise will do better at running schools.*

11. *(1) If privatizing schools would leave poorer, more-difficult-to-educate students at a disadvantage, then privatizing schools will only worsen the problems of the inner cities.*
    *(2) Privatizing would leave poorer, more-difficult-to-educate students at a disadvantage.*

    ---

    *∴ Privatizing schools will [only] worsen the problems of inner cities.*

13. *(1) A nonwhite murderer whose victim is white is much more likely to be executed than a white murderer whose victim is either white or nonwhite.*
    *(2) If that is the case, then either this kind of discrimination should be eliminated, or the death penalty should be abolished.*
    *(3) This kind of discrimination cannot be eliminated.*

    ---

    *∴ Capital punishment should be abolished.*

15. *(1) Smoking is addictive.*
    *(2) If smoking is addictive, then cigarette companies are trafficking in addictive substances.*
    *(3) If cigarette companies are trafficking in addictive substances, then production of cigarettes should be more tightly restricted.*

    ---

    *∴ Production of cigarettes should be more tightly restricted.*

**Exercise 2.2 (pp. 30–31)**

1. *(1) If you buy a fur coat, then you are supporting the fur industry.*
   *(2) If you are supporting the fur industry, then you are encouraging cruel treatment of animals.*

   ∴ *If you buy a fur coat, then you are encouraging cruel treatment of animals.*

3. *(1) Every person has the capacity to kill.*
   *(2) All those who have the capacity to kill should avoid keeping loaded guns around the house.*

   ∴ *Every person should avoid keeping loaded guns around the house.*

5. *(1) Anyone who is overly ambitious will alienate her friends.*
   *(2) Sheila is overly ambitious.*

   ∴ *Sheila will alienate her friends.*

7. *(1) Either the United States will tackle the real social ills that beset its cities, or it will lose the "war on drugs."*
   *(2) The United States will not tackle the real social ills that beset its cities.*

   ∴ *The United States will lose the "war on drugs."*

9. *(1) Any gun law gives advantage to law-breakers.*
   *(2) Anything that gives an advantage to law-breakers makes law-abiders less safe.*

   ∴ *Any gun law makes law-abiders less safe.*

11. *(1) If capital punishment deterred murder better than life imprisonment, then states with capital punishment would have lower murder rates than comparable states with life imprisonment only.*
    *(2) States with capital punishment do not have lower murder rates than comparable states with life imprisonment only.*

    ∴ *Capital punishment does not deter murder better than life imprisonment.*

**Exercise 2.3 (pp. 36–39)**

(2.2) 1. *(1) If A, then B.*
*(2) If B, then C.*

∴ *If A, then C.*

(2.2) 3. *(1) All $P_1$'s are $P_2$'s.*
*(2) All $P_2$'s are $P_3$'s.*

∴ *All $P_1$'s are $P_3$'s.*

(2.2) 5. *(1) All $P_1$'s are $P_2$'s.*
*(2) m is a $P_1$.*
*∴ m is a $P_2$.*

(2.2) 7. *(1) Either A or B.*
*(2) Not A.*
*∴ B.*

(2.2) 9. *(1) All $P_1$'s are $P_2$'s.*
*(2) All $P_2$'s are $P_3$'s.*
*∴ All $P_1$'s are $P_3$'s.*

(2.2) 11. *(1) If A, then B.*
*(2) Not B.*
*∴ Not A.*

2a. *(1) All $P_1$'s are $P_2$'s.*
*(2) m is a $P_1$.*
*∴ m is a $P_2$.*

*(1) Anyone who studies critical reasoning is bound to sharpen his argumentative skills.*
*(2) John is studying critical reasoning.*
*∴ John is bound to sharpen his argumentative skills.*

2c. *(1) If A, then B.*
*(2) A.*
*∴ B.*

*(1) If Paul can find the strength to resist Sheila's advances, then he will be able to salvage some measure of self-respect.*
*(2) Paul will find this strength.*
*∴ He will salvage some self-respect.*

2e. *(1) If A, then B.*
*(2) Not B.*
*∴ Not A.*

*(1) If your car had fuel, it would have kept running.*
*(2) It didn't keep running.*
*∴ Your car doesn't have fuel.*

2g. *(1) All $P_1$'s are $P_2$'s.*
*(2) All $P_2$'s are $P_3$'s.*
*∴ All $P_1$'s are $P_3$'s.*

*(1) Any armed intervention has many innocent victims.*
*(2) Any activity that has many innocent victims should be entered only as a last resort.*
*∴ Any war should be entered only as a last resort.*

| | | |
|---|---|---|
| 2i. | *(1) If A, then B.* | *(1) If a human being is created at the moment of conception, then abortion always kills a human being.* |
| | *(2) If B, then C.* | *(2) If abortion always kills a human being, then it is never justified.* |
| | *∴ If A, then C.* | *∴ If a human being is created at the moment of conception, then abortion is never justfied.* |
| 2k. | *(1) All $P_1$'s are $P_2$'s.* | *(1) Everyone who watches a lot of violent films eventually becomes desensitized to violence.* |
| | *(2) m is a $P_1$.* | *(2) Roberta watches a lot of violent films.* |
| | *∴ m is a $P_2$.* | *∴ Roberta will eventually become desensitized to violence.* |
| 3a. | *(1) All $P_1$'s are $P_2$'s.* | *(1) All true conservatives resist spending for social programs.* |
| | *(2) m is not a $P_2$.* | *(2) Our senator does not resist such spending.* |
| | *∴ m is not a $P_1$.* | *∴ Our senator is not a true conservative.* |
| 3c. | *(1) All $P_1$'s are $P_2$'s.* | *(1) Anyone who has practiced law has been subjected to corrupting influences.* |
| | *(2) Some $P_3$'s are $P_1$'s.* | *(2) Some judges have practiced law.* |
| | *∴ Some $P_3$'s are $P_2$'s.* | *∴ Some judges have been subjected to corrupting influences.* |
| 3e. | *(1) Either A or B.* | *(1) Either you should take control of your own life or trust the advice of a mentor.* |
| | *(2) If B, then C.* | *(2) If you trust the advice of a mentor, then you stand the risk of being used to fulfill the mentor's own dreams.* |
| | *(3) Not C.* | *(3) You should not take that risk.* |
| | *∴ A.* | *∴ You should take control of your own life.* |

**Exercise 2.4 (pp. 41–43)**

(*Note*: There may be more than one acceptable reconstruction.)

1. *(1) Either gun control is unconstitutional, or artistic expression is not constitutionally guaranteed.*
   [OR EQUIVALENTLY: *If gun control is constitutional, then artistic expression is not constitutionally guaranteed.*]
   *(2) Artistic expression is constitutionally guaranteed.*

   ---

   ∴ *Gun control is unconstitutional.* [OR *Gun control is not constitutional.*]

3. (*1) If gender testing becomes widely accessible, then people must be able to resist using it for sex education.*
   *(2) People will not be able to resist using gender testing for sex selection.*

   ---

   ∴ *We should not allow gender testing to become widely accessible.*

**Exercise 2.5 (pp. 45–46)**

1. If the first sentence is taken to be the point of the passage, then the third sentence could be kept as supporting this thesis, but the second and fourth sentences should be eliminated. Alternatively, a paragraph could be built around the point that God does exist, in which case the second sentence could be used as support, and the first and third sentences could be eliminated.

3. The tone of the first sentence suggests that the writer favors equal rights for women but opposes sending women into war on the grounds that it is unfair to do so while not granting women equal rights. The last sentence, however, backs away from supporting equal rights, and the preceding sentence opposes having women receive military training alongside men on grounds other than fairness. If the thesis of the paragraph is that women shouldn't be trained for and sent into combat, then the last sentence should be eliminated, and the first sentence should be moved into the body of the paragraph and modified so that it is clear that it provides an additional reason against sending women into combat.

   A reconstruction might read as follows: Training women for combat exposes them to harassment and sexist abuse. Furthermore, it would be unfair to send women into combat as long as they have not been given equal rights. So training women for combat at the present time would be both cruel and unjust.

## Chapter 3

### Exercise 3.1 (pp. 58–65)

1a. *(1) If A, then B.*
*(2) [A].*
*∴ B.*

*[The Netwizard computer runs Webmeister software.]*

1c. *(1) If A, then B.*
*(2) If [B], then [C].*
*∴ If A, then C.*

*If [it is not the case that I can do word processing], then [it is not the case that it meets my needs].*

[ALTERNATIVELY]

*(1) If not A, then not B.*
*(2) If [not B], then [not C].*
*∴ If not A, then not C.*

*If it is not the case that [I can do word processing], then it is not the case that [it meets my needs].*

1e. *(1) Either [A] or [B].*
*(2) Not B.*
*∴ A.*

*Either [I should buy a Netwizard computer] or [I should buy a Hacker 1000 computer].*

1g. *(1) All $P_1$'s are $P_2$'s.*
*(2) All [$P_2$'s] are [$P_3$'s].*
*∴ All $P_1$'s are $P_3$'s.*

*All [products guaranteed three years] are [products that give you a lot of protection against faulty workmanship].*

1i. *(1) If A and B, then C.*
*(2) [A].*
*(3) [B].*
*∴ C.*

*[The Netwizard can run Webmeister.]*
*[The Netwizard is cheaper than the Hacker 1000.]*

1k. *(1) Either A or B.*
*(2) If C, then not B.*
*(3) [C].* — *[This money was given to me for my education.]*

*∴ A.*

2a. *(1) A.* — *(1) You promised to be here at 8:00.*
*(2) If A, then B.* — *(2) If you promised to be here at 8:00, then you should have arrived at 8:00.*

*∴ B.* — *∴ You should have arrived at 8:00.* (IMPLICIT)

2c. *(1) If A, then B.* — *(1) If you tell lies frequently, then you must remember not only what you have done but also what you said you have done.*
*(2) If B, then C.* — *(2) If you must remember not only what you have done but also what you said you have done, then your memory becomes burdened.* (IMPLICIT)

*∴ If A, then C.* — *∴ If you tell lies frequently, your memory becomes burdened.*

2e. *(1) All $P_1$'s are $P_2$'s.* — *(1) Any social institution that spends beyond the willingness of the public to pay is eroding its public support.*
*(2) m is a $P_1$.* — *(2) American universities are social institutions that spend beyond the willingness of the public to pay.* (IMPLICIT)

*∴ m is a $P_2$.* — *∴ American universities are eroding their public support.*

2g. *(1) A.* — *(1) There are not enough nuclear power stations under construction.*
*(2) If A, then B.* — *(2) If there are not enough nuclear power stations under construction, then we will face substantial energy shortages by the year 2020.* (IMPLICIT)

*∴ B.* — *∴ We will face substantial energy shortages by the year 2020.*

2i.

| | |
|---|---|
| *(1) All $P_1$'s are $P_2$'s.* | *(1) Every successful politician has to compromise his principles occasionally.* |
| *(2) All $P_2$'s are $P_3$'s.* | *(2) Everyone who has to compromise his principles occasionally loses integrity.* |
| *∴ All $P_1$'s are $P_3$'s.* | *∴ Every successful politician loses integrity.* (IMPLICIT) |

2k. *(1) The burglar was under five feet tall.*
*(2) Albert is not under five feet tall.* (IMPLICIT)

*∴ Albert is not the burglar.*

2m. *(1) Everyone who smokes opium is happy.*
*(2) You are not happy.* (IMPLICIT)

*∴ You don't smoke opium.*

2o. *(1) Alice has a new job in Minneapolis.*
*(2) If so, then she'll be moving.*
*(3) If she'll be moving, then Bruce or Frank will get a promotion.*
*(4) Frank will not get a promotion.* (IMPLICIT)

*∴ Bruce will get a promotion.*

2q. *(1) Public awareness about oil spills, depletion of the ozone layer, and the "greenhouse effect" is growing rapidly.*
*(2) If public awareness about oil spills, depletion of the ozone layer, and the "greenhouse effect" is growing rapidly, then political incentives are sufficiently high [concerning the issue].*
*(3) If political incentives are sufficiently high [concerning the issue], then mobilization of technological resources will occur.*
*(4) If mobilization of technological resources will occur, then the industrial nations will resolve the environmental crises that are looming for the near future.*

*∴ The industrialized nations will resolve the environmental crises that are looming for the near future.* (IMPLICIT)

2s. *(1) If a bad environment causes people to become criminals, then everyone from a bad environment would be a criminal.*
*(2) Not everyone from a bad environment is a criminal.*

*∴ It isn't a bad environment that causes people to become criminals.*

3a. Reconstruction (ii) is adequate. It uses all the premises in the argument. Reconstruction (i) doesn't use all the premises and includes a premise (2) that is not mentioned in the passage. Further the conclusion is at odds with the passage as a whole. Reconstruction (iii) includes a conclusion that is compatible with the passage, but also contains premise 2 that is not in the passage.

3c. Reconstruction (iii) is adequate, although quite "bold." Both (i) and (ii) take the "easy way out" using the if-then and are restricted to Mervin rather than to characteristics of people who are devoted to becoming famous journalists.

**Exercise 3.2 (pp. 68–70)**

1. Lazy people usually suffer; hardworking people benefit.

3. Only turning to nature provides an escape from the harm of technological society.

5. A good teacher knows his or her subject, interacts well with students, and seeks objective feedback on his or her performance.

7. People don't really know what they want; their wants are created for them (by advertising and so on).

9. GENERAL PARAPHRASE OF CENTRAL CLAIM: Schizophrenia can be healed through a natural process by which people who have recovered guide a patient through his or her madness.

**Exercise 3.3 (pp. 76–83)**
(These arguments can be reconstructed in more than one way.)

1a. *(1) If something never existed, then it can't be restored.* (IMPLICIT)
*(2) Democracy in Haiti never existed.*

---

*∴ Democracy in Haiti can't be restored.*

1c. *(1) Sex is private and intimate.*
*(2) Whatever is private and intimate should not be publicized.* (IMPLICIT)

---

*∴ Sex should not be publicized.* (SUBORDINATE CONCLUSION)
*(3) If sex education is permitted, then sex will be publicized.* (IMPLICIT)

---

*∴ Sex education should not be permitted.*

1e. *(1) Making collective (i.e., racist) judgments harms innocent human beings and their quest for equality.*

*(2) Whatever harms innocent human beings and their quest for equality is wrong.* (IMPLICIT)

---

*∴ Making collective (i.e., racist) judgments is wrong.*

1g. *(1) The nation needs to either expand government spending on the poor, or cut it back, or form a policy that teaches the needy how to live.*

*(2) If spending on the poor should be expanded, then such spending should reduce poverty.*

*(3) Such spending doesn't reduce poverty.*

*(4) If spending should be cut back, then the poor must be assumed to be competent managers of their own lives.*

*(5) The poor cannot be assumed to be competent managers of their own lives.*

---

*∴ The nation needs to form a policy that teaches the needy how to live.*

1i. *(1) The tobacco industry's main concern is protecting itself, not preventing the harm caused by smoking.*

*(2) If premise 1, then we should not accept the tobacco industry's claim that secondhand smoke is harmless.*

---

*∴ We should not accept the tobacco industry's claim that secondhand smoke is harmless.*

2a. Lecture Fragment—Plea Bargaining
Argument I (for eliminating plea bargaining):

*(1) Plea bargaining causes some innocent defendants to plead guilty.*

*(2) Plea bargaining makes no presumption of innocence.*

*(3) Plea bargaining substitutes negotiation of guilt for an adversarial process.*

*(4) Plea bargaining sacrifices the interests of society.*

*(5) Any practice that has the defects described in premises 1–4 should be eliminated.* (IMPLICIT)

---

*∴ Plea bargaining should be eliminated.*

**Exercise 3.4 (pp. 86–87)**

1. We can't justify capital punishment by appeal to its supposed deterrent effect. After all, in special circumstances killing an innocent person as a scapegoat might have a deterrent effect, but that doesn't make it justified.

3. According to Darwin's theory of evolution, animals are adapted to the biological niche they occupy, so large-scale environmental change will affect

most animals because it will alter these niches. We already see this happening in lakes subjected to acid rain. When lakes become more acidic, fish can no longer live in them.

## Chapter 4

### Exercise 4.1 (pp. 100–101)

1.

| | Invalid Pattern |
|---|---|
| *(1) Anyone who lives with a smoker has an above-average risk of heart disease.* | *(1) All $P_1$'s are $P_2$'s.* |
| *(2) Sarah doesn't live with a smoker.* | *(2) m is not a $P_1$.* |
| *∴ Sarah doesn't have an above-average risk of heart disease.* | *∴ m is not a $P_2$.* |

COUNTEREXAMPLE:

*(1) Anyone who is a mother is female.*
*(2) Sarah is not a mother.*

*∴ Sarah is not a female.*

DESCRIBING AN INVALIDATING ALTERNATIVE: (Smoking is not the only risk factor.) Sarah doesn't live with a smoker but loves to eat Big Macs and other high-fat foods. She also comes from a family with a history of heart disease.

3.

| | Invalid Pattern |
|---|---|
| *(1) If dinner guests are coming, then we need more food.* | *(1) If G, then F.* |
| *(2) If we need more food, then we need to go to the store.* | *(2) If F, then S.* |
| *(3) Dinner guests aren't coming.* | *(3) Not G.* |
| *∴ We don't need to go to the store.* | *∴ Not S.* |

COUNTEREXAMPLE:

*(1) If the Statue of Liberty is in San Francisco, then it is in California.*
*(2) If the Statue of Liberty is in California, then it is in the United States.*
*(3) The Statue of Liberty is not in San Francisco.*

*∴ The Statue of Liberty is not in the United States.*

DESCRIBING AN INVALIDATING ALTERNATIVE: (We might need food even though the guests aren't coming.) The guests aren't coming. We had to take an unexpected trip out of town, but we do need food anyway because we didn't get a chance to shop.

5.

| | Invalid Pattern |
|---|---|
| *(1) If the American people feel overtaxed, then they will press for tax cuts.* | *(1) If T, then C.* |
| *(2) The American people don't feel overtaxed.* | *(2) Not T.* |
| *∴ The American people won't press for tax cuts.* | *Not C.* |

COUNTEREXAMPLE:

*(1) If the Martin Luther King Memorial is in Hawaii, then it is in the United States.*

*(2) The Martin Luther King Memorial is not in Hawaii.*

*∴ The Martin Luther King Memorial is not in the United States.*

DESCRIBING AN INVALIDATING SITUATION: Even if they don't feel overtaxed, the American people could still press for tax cuts because they perceive that there is a surplus, and they want their share of it.

7.

| | Invalid Pattern |
|---|---|
| *(1) All good friends are compassionate people.* | *(1) All $P_1$'s are $P_2$'s.* |
| *(2) All good friends are honest people.* | *(2) All $P_1$'s are $P_3$'s.* |
| *∴ All compassionate people are honest.* | *∴ All $P_2$'s are $P_3$'s.* |

COUNTEREXAMPLE:

*(1) All mothers are animals.*

*(2) All mothers are female.*

*∴ All animals are female.*

DESCRIBING AN INVALIDATING ALTERNATIVE: Even if good friends were compassionate and honest (at least toward those with whom they are friends), still, someone who is compassionate but not a good friend might be dishonest. For example, if you were unhappy, such a person might tell you lies to flatter you and make you feel happy.

9.

| | Invalid Pattern |
|---|---|
| *(1) Anyone who is good at science is good at math.* | *(1) All $P_1$'s are $P_2$'s.* |
| *(2) Anyone who is good at math is intelligent.* | *(2) All $P_2$'s are $P_3$'s.* |
| *∴ Anyone who is intelligent is good at science.* | *∴ All $P_3$'s are $P_1$'s.* |

COUNTEREXAMPLE:

*(1) Anyone who is in North Dakota is in the Midwest.*
*(2) Anyone who is in the Midwest is in the United States.*

*∴ Anyone who is in the United States is in North Dakota.*

DESCRIBING AN INVALIDATING ALTERNATIVE: (There are different ways of being intelligent.) An artist such as Andy Warhol could have been quite intelligent (in dealing with the art world) without being particularly good at science.

**Exercise 4.2 (p. 105)**

1. In the United States there is little connection between whether a state has capital punishment and the homicide rate. States with death penalties (even more executions) have high homicide rates, and some states without the death penalty have low homicide rates. This suggests that the existence or absence of the death penalty does not markedly affect the homicide rate. If so, then eliminating capital punishment is unlikely to increase the homicide rate. Furthermore, even if abolishing capital punishment did tend to increase the homicide rate, demographic factors such as a drop in the percentage of young males in the population could outweigh this tendency.

3. Driving cars might make people aggressive, but it is certainly questionable whether this activity should be discouraged. Training for work in the military or security fields might make people more aggressive, but such activity is (unfortunately) necessary and permissible.

5. Stock car and other types of racing put spectators (bystanders) at some risk. Occasionally accidents cause cars to become airborne and crash into the stands, injuring people. The rights of the spectators are not violated. Their voluntary decision to subject themselves to this risk by buying tickets would seem to preclude such "rights." Similarly, if someone sneaks behind barricades to get closer to a building demolition, the risk posed to them by the activity does not violate their rights. What seems crucial in these cases is that the bystanders are not "innocent." They know (or should know) the risks inherent in being near where the activity is being conducted. In another class of cases, the benefits of an action might clearly outweigh the health risk

to bystanders. Shutting down a water system might risk the health of those who are forced to live (temporarily) without water, but if the system is contaminated the health benefits to those "bystanders" outweigh the health risks.

7. At any given time, Social Security is not used by most people in the sense that they are actually getting benefits. People pay into the system, however, in expectation of future benefits. Other aspects of government are like insurance that is never used (but might be). People should buy fire insurance even though most of them will never use it. Similarly, some military expenses might serve as insurance even if they are never used in a military conflict. Even when people don't get direct benefit—they may never drive on a freeway or U.S. highway in Maine, nor even buy products that are shipped over this highway—it can be reasonably argued that they should pay gasoline taxes or extra transportation costs on what they buy. These are used to build highways.

9. Even if Asian and European countries have much higher average scores on science and math exams, it doesn't follow that the United States should adopt the educational methods of these countries. First, the United States does well by its best students. Furthermore, the higher average scores in Asia and Europe might be due in part to social and cultural factors rather than educational methods. Finally, there are features of American education that are valuable even though they don't produce high average science and math scores. For example, in contrast to Japanese education, schools in the United States might be seen as encouraging unconventional but potenially creative students.

**Exercise 4.3 (pp. 110–111)**

1a. The conclusion follows, but the first premise is surely false.

1c. The conclusion does not follow.

2a. *(1) If Los Angeles is in Texas, then Los Angeles is in the Lone Star State.*
*(2) Los Angeles is in Texas.*

---

*∴ Los Angeles is in the Lone Star State.*

2c. *(1) No bankers are overweight.*
*(2) All overweight people will have a heart attack.*

---

*∴ No bankers will have a heart attack.*

3(i)a. Misuse of terms

3(i)c. Sensible use of terms

3(i)e. Misuse of terms

3(ii)a. Inconsistent

3(ii)c. Consistent

**Exercise 4.4 (pp. 119–122)**

1a. *(1) Any activity that makes people aggressive should be discouraged.*
*(2) Football makes people aggressive.*

*∴ Football should be discouraged.*

The conclusion follows from the premises (with the provisions discussed in the chapter about arguments containing "should"). But premise 1 has counterexamples, which were pointed out in the answer to Exercise 4.2, No. 3.

1c. *(1) If the government's antidrug policies are effective, then drug use will begin to decline.*
*(2) Drug use is beginning to decline.*

*∴ The government's antidrug policies are effective.*

The conclusion doesn't follow from the premises. It could be that drug use is beginning to decline for some reason other than the government's antidrug effort. Perhaps it is declining because some well-publicized deaths from drugs are making users and potential users increasingly aware of the health dangers associated with drug use.

1e. *(1) If the average couple has more than two children, the population will rise drastically.*
*(2) We should prevent the population from rising drastically.*

*∴ We should prevent any couple from having more than two children.*

There is a subtle shift in wording that makes this argument invalid. The first premise says that if the average couple has more than two children, the population will rise drastically. The conclusion says that we should prevent any couple from having more than two children. All that would follow from these premises is that we should prevent the average couple from having more than two children. This would require much less drastic measures on the part of government than would the stated conclusion. The premises could also be called into question.

1g. *(1) If we allow doctors to determine the gender of a fetus whenever parents request it, then (some) parents will abort a fetus simply because of its gender.*
*(2) We shouldn't allow parents to abort a fetus simply because of its gender.* (IMPLICIT)

*∴ We shouldn't allow doctors to determine the gender of a fetus when parents request it.*

The conclusion follows from these premises (at least if we allow "value arguments" resembling *modus tollens*). But premise 1 assumes that when doctors determine the sex of a fetus, they will give this information to parents. It would be possible to have a policy that allows doctors to make this determination (for example, to detect sex-linked diseases) but that doesn't generally make this information available to parents. Premise 2 sounds persuasive, but keep in mind how strong an assertion this must be in order for the argument to be valid. The premise can't merely assert that allowing parents to abort a fetus because of its sex is a bad thing. Rather, it must assert that we must prevent this state of affairs—using abortion for sex selection—from coming about. In reply, a critic could admit that sex selection by means of abortion is a bad consequence that we would hope to minimize. However, the benefits of allowing doctors to determine the sex of a fetus (especially in detecting sex-linked disease) outweigh the risk that some parents will misuse information concerning the sex of the fetus.

1i. *(1) All tax increases are unjustified at this time.*
*(2) User fees to get into national parks are not taxes.*

---

*∴ Increasing user fees into national parks is justified.*

The conclusion does not follow from the premises. Even if tax increases are unjustified, we need not assume that an increase in other government fees (assuming they are not taxes) is thereby justified. Both tax increases and fee increases might be unjustified.

1k. *(1) People should pay taxes to support only parts of the government they use.*
*(2) People without children don't use the schools.* (IMPLICIT)

---

*∴ People without children shouldn't be required to pay for schools.*

The conclusion follows from the stated premise, plus the implicit premise that people without children don't use the schools. Both the explicit and implicit premises are doubtful. Arguably, government can function only if individuals are willing to pay for at least some benefits to others that they themselves will not directly use. Projects in some distant part of the country are "traded off" for projects close to home.

Further, it is plausible to assume that if we interpret "use" in a slightly broader way than direct personal use (by a person or at least by his or her family), then people without children do use the schools, contrary to the implicit premise. After all, the economic well-being of a community depends to a significant degree on the general educational level of its citizens, and a person benefits from ("uses") the economic resources of the community.

## Chapter 5

### Exercise 5.1 (pp. 125–127)

1a. A; 1c. ¬ A → B; 1e. A → (B ∨ C); lg. (A & B) → (C & D); 1i. ¬ (A & B) → C

2a. ¬ ¬ A or alternatively A; 2c. A ∨ B; 2e. ¬ (A ∨ B), alternatively, ¬ A & ¬ B

3a. From problem 1a in Exercise 3.1:

*(1)* $A \rightarrow B$. — *A: The Netwizard computer runs Webmeister software.*

*(2)* $A$. — *B: The Netwizard computer can meet my needs.*

∴ $B$.

From problem 1c in Exercise 3.1:

*(1)* $\neg A \rightarrow \neg B$. — *A: The Hacker 1000 does run Webmeister.*

*(2)* $\neg B \rightarrow \neg C$. — *B: I can do word processing on it (the Hacker 1000).*

∴ $\neg A \rightarrow \neg C$. — *C: The Hacker 1000 does meet my needs.*

From problem 1e in Exercise 3.1:

*(1)* $A \vee B$. — *A: I should buy a Netwizard computer.*

*(2)* $\neg B$. — *B: I should buy a Hacker 1000.*

∴ $A$.

3b. From problem 3a in Exercise 3.1:

(i) *(1)* $A \vee B$. — *A: We should cut taxes.*

*(2)* $\neg B$. — *B: We should (use this opportunity to) preserve Social Security and expand medical coverage.*

∴ $A$. — *C: We will be unable to fund Social Security and expanded medical care when the need inevitably arises.*

(iii) *(1)* $B$. — *D: We have an obligation to those who paid into Social Security.*

*(2)* $D$ & $E$.

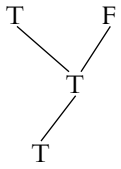
∴ $\neg A$. — *E: It would be inhumane to leave our citizens without medical insurance.*

4a. *(1)* $A \vee B$.
*(2)* $B \rightarrow C$.
*(3)* $\neg C$.
$\therefore$ $A$.

4c. *(1)* $A \rightarrow B$.
*(2)* $B \rightarrow C$.
*(3)* $\neg C \vee D$.
*(4)* $\neg D$.
$\therefore$ $\neg A$.

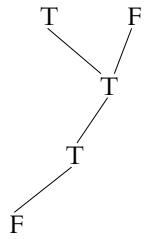
**Exercise 5.2 (pp. 133–134)**

1a. $A \rightarrow \neg B$



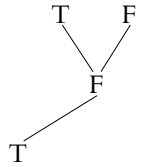

Initial Assignment
*Row 2 Negation*
*Row 1 Conditional*

1c. $\neg ( A \ \& \neg B)$



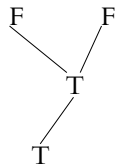

Initial Assignment
*Row 2 Negation*
*Row 1 Conjunction*
*Row 1 Negation*

1e. $\neg (A \leftrightarrow B)$



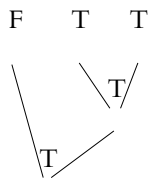

Initial Assignment
*Row 2 Biconditional*
*Row 1 Negation*

2a. $A \rightarrow \neg B$



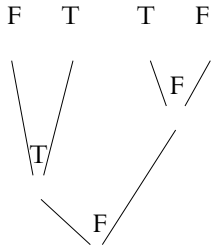

Initial Assignment
*Row 2 Negation*
*Row 3 Conditional*

3a. $A \rightarrow (B \vee C)$



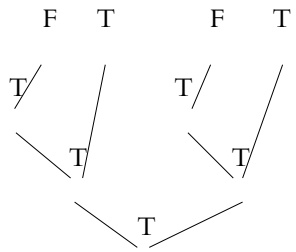

Initial Assignment
*Row 1 Disjunction*
*Row 3 Conditional*

3c. $(A \vee B) \rightarrow (C \,\&\, D)$



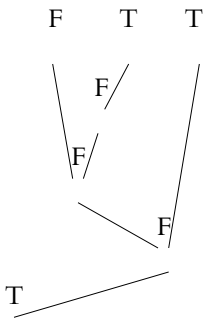

Initial Assignment
*Row 2 Conjunction*
*Row 3 Disjunction*
*Row 2 Conditional*

3e. $(\neg A \rightarrow B) \vee (\neg D \rightarrow C)$




Initial Assignment
*Row 2 Negation*
*Row 1 Conditional*
*Row 1 Disjunction*

3g. $(\neg (A \vee \neg B) \,\&\, C)$




Initial Assignment
*Row 1 Negation*
*Row 4 Disjunction*
*Row 3 Conjunction*
*Row 2 Negation*

**Exercise 5.3 (pp. 139–141)**

1b.

| Initial Assignments | | | Premises | | | Conclusion |
|---|---|---|---|---|---|---|
| $A$ | $B$ | $C$ | $A \to B$ | $B \to C$ | $A$ | $C$ |
| T | T | T | T | T | T | T |
| T | T | F | T | F | T | F |
| T | F | T | F | T | T | T |
| T | F | F | F | T | T | F |
| F | T | T | T | T | F | T |
| F | T | F | T | F | F | F |
| F | F | T | T | T | F | T |
| F | F | F | T | T | F | F |

Note that all premises are true in the first line only, and the conclusion is also true in this situation. So the argument is valid.

2a.

| Initial Assignments | | Premises | | Conclusion |
|---|---|---|---|---|
| $A$ | $B$ | $\neg A \to B$ | $A$ | $B$ |
| T | T | T | T | T |
| T | F | T | T | F |
| F | T | T | F | T |
| F | F | F | F | F |

Invalid. Note the second line where the premises are all true and the conclusion false.

3a.

| Initial Assignments | | Premises | | Conclusion |
|---|---|---|---|---|
| $A$ | $B$ | $A \to \neg B$ | $B$ | $\neg A$ |
| T | T | F | T | F |
| T | F | T | F | F |
| F | T | T | T | T |
| F | F | T | F | T |

Valid. Note that only the third line has (all) the premises true. The conclusion is also true in this situation.

3c.

| Initial Assignments | | Premise | Conclusion |
|---|---|---|---|
| $A$ | $B$ | $A \to B$ | $B \to A$ |
| T | T | T | T |
| T | F | F | T |
| F | T | T | F |
| F | F | T | T |

Invalid. Note that on the third line the single premise is true, but the conclusion is false.

3i.

| Initial Assignments | | | Premises | | | Conclusion |
|---|---|---|---|---|---|---|
| $A$ | $B$ | $C$ | $A \rightarrow \neg B$ | $\neg B \vee C$ | $A$ | $C$ |
| T | T | T | F | T | T | T |
| T | T | F | F | F | T | F |
| T | F | T | T | T | T | T |
| T | F | F | T | T | T | F |
| F | T | T | T | T | F | T |
| F | T | F | T | F | F | F |
| F | F | T | T | T | F | T |
| F | F | F | T | T | F | F |

Invalid. Note that in the fourth line all the premises are true and the conclusion is false.

3m.

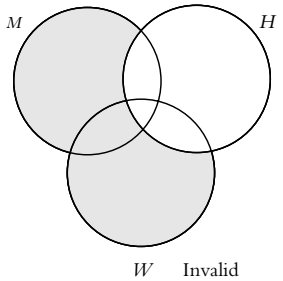
| Initial Assignments | | | Premises | | | Conclusion |
|---|---|---|---|---|---|---|
| $A$ | $B$ | $C$ | $A \leftrightarrow B$ | $B \rightarrow C$ | $\neg C$ | $A$ |
| T | T | T | T | T | F | T |
| T | T | F | T | F | T | T |
| T | F | T | F | T | F | T |
| T | F | F | F | T | T | T |
| F | T | T | F | T | F | F |
| F | T | F | F | F | T | F |
| F | F | T | T | T | F | F |
| F | F | F | T | T | T | F |

Invalid. Note the last line in which all the premises are true and the conclusion is false.

**Exercise 5.4 (pp. 148–149)**

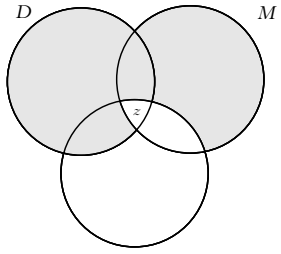
1a.

| | | |
|---|---|---|
| | *All men are human.* | $(x)\ (Mx \rightarrow Hx)$ |
| | *All women are human.* | $(x)\ (Wx \rightarrow Hx)$ |
| $\therefore$ | *All men are women.* | $\therefore\ (x)\ (Mx \rightarrow Wx)$ |



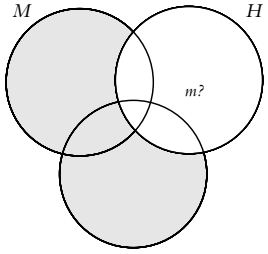

Invalid

| | | |
|---|---|---|
| 1c. | *All dogs are mammals.* | *(x) (Dx → Mx)* |
| | *All mammals are animals.* | *(x) (Mx → Ax)* |
| | *Zeke is a dog.* | *Dz* |
| | ∴ *Zeke is an animal.* | ∴ *Az* |



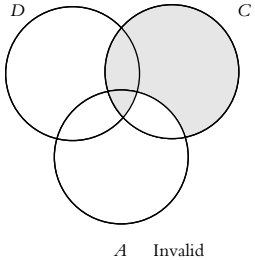

Valid

| | | |
|---|---|---|
| 1e. | *All men are human.* | *(x) (Mx → Hx)* |
| | *All women are human.* | *(x) (Wx → Hx)* |
| | *Madonna is not a man.* | ¬ *Mm* |
| | ∴ *Madonna is not a woman.* | ∴ ¬ *Wm* |



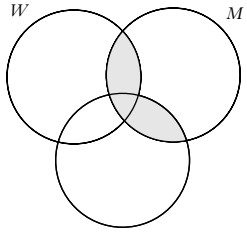

Invalid

| | | |
|---|---|---|
| 2a. | *No dogs are cats.* | *(x) (Dx → Cx)* |
| | *All cats are animals.* | *(x) (Cx → Ax)* |
| | ∴ *No dogs are animals.* | ∴ *(x) (Dx → ¬ Ax)* |



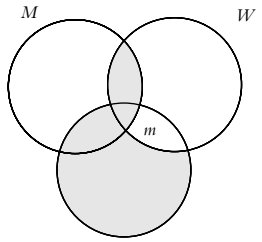

Invalid

| | | |
|---|---|---|
| 2c. | *No women are men.* | *(x) ( Wx → ¬ Mx)* |
| | *No men are mothers.* | *(x) ( Mx → ¬ Nx)* |
| ∴ | *No women are mothers.* | *(x) (Wx → ¬ Nx)* |



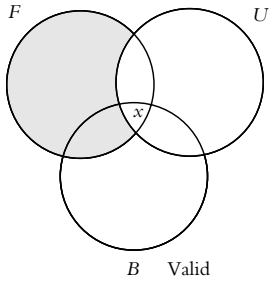

Invalid

| | | |
|---|---|---|
| 2e. | *No men are women.* | *(x) (Mx → ¬ Wx)* |
| | *Every female vocalist is a woman.* | *(x) (Fx → Wx)* |
| | *Madonna is a female vocalist.* | *Fm* |
| ∴ | *Madonna is not a man.* | *∴ ¬ Mm* |




Valid

| | | |
|---|---|---|
| 3a. | *All products high in fat are unhealthy.* | *(x) (Fx → Ux)* |
| | *Some cuts of beef are high in fat.* | *(∃x) (Bx & Fx)* |
| ∴ | *Some cuts of beef are unhealthy.* | *∴ (∃x) (Bx & Ux)* |

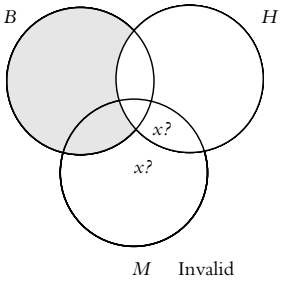



Valid

3c. *All bank presidents are human.* $(x)\ (Bx \rightarrow Hx)$

*Some men are not bank presidents.* $(\exists x)\ (Mx\ \&\ \neg\ Bx)$

$\therefore$ *Some bank presidents are not human.* $\therefore\ (\exists x)\ (Bx\ \&\ \neg\ Hx)$

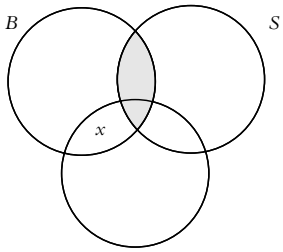



Invalid

3e. *No boring job is satisfying.* $(x)\ (Bx \rightarrow \neg\ Sx)$

*Some well-paying jobs are boring.* $(\exists x)\ (Wx\ \&\ Bx)$

$\therefore$ *Some well-paying jobs are not satisfying.* $\therefore\ (\exists x)\ (Wx\ \&\ \neg\ Sx)$




Valid

## Chapter 6

### Exercise 6.1 (pp. 160–163)

1a. Answered in text

1c. False dilemma. Perhaps this is persuasive because we like to have our options simplified: Either you find a way to save a lot or you should forget about it. (*Note*: If-then in the passage can be treated as an "or." "If not *A*, then *B*" is logically equivalent to "*A* or *B*." You don't look for a third alternative. What's wrong with saving a little?)

1e. Straw man. You are probably struck by the weakness of this argument against drug legalization and distracted from considering that there are much stronger arguments against it.

1g. False dilemma and slippery slope. There are many choices between these two extremes. Furthermore, if cigarettes and "self-abuse" at 15 led to being a moral and physical wreck at 48, then there would be a lot of moral and physical wrecks. The illustration was probably effective in its day because the

prospect of becoming dissipated and then outcast would have been frightening enough to distract the reader's attention from the implausibility of the argument.

1i. False dilemma. This argument gives you the same kind of all-or-nothing choice as in argument 1c. This simplicity might be appealing, but why not tackle a main part of the problem, even if it doesn't solve the entire problem?

**Exercise 6.2 (pp. 170–172)**

1a. Denying the antecedent. This resembles a valid argument.

1c. Affirming the consequent. (If we're nice guys, then we'll finish last. We'll finish last. Therefore, we're nice guys.) This resembles a valid argument.

1e. Begging the question. If this persuaded anyone, it would be because the premise is stated in slightly different words from the conclusion, making it less apparent that no additional reason is being given for the conclusion.

1g. Denying the antecedent. This resembles a good argument.

1h. Equivocation. "Invasion" at first simply means large numbers coming into the country illegally. Then, to justify using lethal force, "invasion" is given the connotation of an attack on this country. But one who is inclined to agree with the conclusion of the argument would probably overlook this shift in meaning.

3b. False dilemma. Not everyone who can beat you deserves to have you join them, but the two alternatives of beating or joining probably sound more comfortable than any third alternative.

3d. Affirming the consequent. Creativity could have flourished for some other reason. Persuasive because it resembles a valid argument.

3e. False dilemma. There are more choices than being either hip or smart.

3h. "Reverse" of slippery slope. It is doubtful that all these things follow from this kind of peace of mind. But seeing some kinds of good follow from a practice leads one to expect all manner of good to follow.

**Exercise 6.3 (pp. 178–179)**

1. Appeal to pity
3. Prejudicial language
5. Appeal to pity
7. Appeal to force

**Exercise 6.4 (pp. 186–188)**

2a. Straw man, false dilemma, begging the question
2c. Equivocation ("duty"), prejudicial language
2e. Attacking the person, appeal to pity
2g. Equivocation ("welfare"), slippery slope
2i. Prejudicial language, attacking the person

**Exercise 6.5 (pp. 189–190)**

1. It might be claimed that this is the fallacy of appeal to pity. The question of whether this is a fallacy hinges on what the jury is deciding (or should decide). If the decision is simply one of guilt or innocence, then the appeal is fallacious. If the question is whether the accused should be imprisoned, then the appeal to pity is not fallacious.

3. The arguer raises for us the issue of whether this argument begs the question. In our discussion of this fallacy, we pointed out that an argument shouldn't use a premise that is just as doubtful, and doubtful on similar grounds, as the conclusion. We assume that the arguer is speaking on behalf of taxpayers to someone who thinks the government should provide free child care to parents. The point of the argument is that people are more inclined to claim they have a right to something if they ignore the question of why someone else should have an obligation to provide it for them. In this sense, for many audiences, the premise that I have no obligation to give you something would be a reason for believing that you do not have a right to it. For such an audience, the argument would not be question-begging, even though the premise could be disputed.

5. The question is whether this is a fallacious attack on the person. If Franklin gave reasons for living in certain ways, independent of any attempt to set an example, then an assessment of his philosophy of life should focus on these reasons. Perhaps Franklin wasn't able to follow his own advice concerning how one should live, but his advice would work for many other people. Still, since Franklin had his own rules available to him as guides for living, if his own life was not happy, then this raises the question of how useful or workable his rules would be for others.

7. This example raises a puzzle concerning how a scientific theory is confirmed. The passage seems to say: "If the theory is correct, then we would expect these continental movements. The continental movements did occur. So the theory is correct." But this would be the fallacy of affirming the consequent. So what kind of argument *should* we be making when we confirm a theory? This issue is touched upon in chapters 8 and 9.

## Chapter 7

### Exercise 7.1 (pp. 201–202)

1a. The term "man" could refer to the human species or to individual human beings. "Free" could mean "having no constraints" or "having the power to do what one wants." It is probably true that the human species was, at some time in the distant past, free in the sense that it had no elaborate social constraints, but it was not free in the second sense. Individual human beings are or have been enslaved (so not all are free in the first sense); nor is anyone born free in the second sense. Everyone faces some constraints or limitations in their lives.

1c. The expression "indirect suicide" is vague. If we interpret it in such a way that a person who plays "Russian roulette" with a loaded gun participates in indirect suicidal behavior, the statement is true. If eating fatty red meat turns out to be as unhealthy as is sometimes suggested, then this too could be considered indirectly suicidal. But it is unclear, even with recent health warnings, that eating red meat should be "strongly condemned." If we specify the term in this broad way, the statement is false.

1e. The term "war" is ambiguous. It could mean either "an extensive armed conflict" or "a concerted public effort to eliminate or alter some unacceptable condition." Since the "war on poverty" was not a war in the first sense, interpreting it in this way would make the statement true. But it would be false if interpreted in the second sense.

1g. "Fine" is ambiguous. It could mean quite acceptable, or it could mean that a fine can be levied. The accused interpreted it in the second way; a conventional reading would have interpreted it in the first. From the legal point of view, the statement is false given the first reading and true given the second.

1i. This passage trades on an ambiguity in the term "democracy." In one sense, a democracy is a form of government that has mechanisms to represent the views of the citizens. In a second sense, it must do more than merely permit these views to be represented. The citizens must actually participate in the process, at least to the extent that they vote for their representatives. The first sentence in the passage is false under the first interpretation and true under the second.

2a. RECONSTRUCTION:

*(1) The United States is ruled by the people.*

*(2) All countries ruled by the people are democracies.*

---

*∴ The United States is a democracy.*

ASSESSMENT: The argument is valid. The United States has a form of government that allows for "rule by the people" rather than by a king or an aristocracy. The actual power of the people has varied during American history. It is possible to have democratic institutions without having democracy in practice. If the conclusion is construed as meaning democracy in practice, then we must construe it as such in the premises as well. The degree of actual citizen participation and impact in the U.S. government is a matter of some debate, especially if we look at American political and social history.

2c. RECONSTRUCTION:

*(1) If space is expanding, it is finite.*
[ALTERNATIVELY: *Either space is not expanding or it is finite; "A unless B" is interpreted as "A or B."*]

*(2) Space is not finite.*

---

*∴ Space is not expanding.*

ASSESSMENT: The argument is valid. The term "finite" can be interpreted in at least two ways. In the first sense, something is finite if it has a boundary. But there is another sense in which something could be bounded, like the surface of the earth, but still we could travel indefinitely without reaching a boundary—we could just circle the earth endlessly. Similarly, space could be expanding, but no path in space needs to be in a boundary. It could be infinite, but bounded. So the sense of "finite" that makes premise 2 true might not make premise 1 true.

2e. RECONSTRUCTION:

*(1) We can't confidently predict the job market.*

*(2) If we can't confidently predict the job market, then we can't form a reasonable idea about what to do with our lives.*

*(3) If we can't form a reasonable idea about what to do with our lives, then we shouldn't go to college.*
[ALTERNATIVELY: *If we go to college, then we must form a reasonable idea about what to do with our lives.*]

---

*∴ We shouldn't go to college.*

ASSESSMENT: The argument is valid, but the expression "confidently predict the job market" is vague. It is true that we can't precisely predict all the particulars about future employment opportunities. And all bets are off if nuclear terrorism occurs. But some general predictions can be made about broad trends, and this might be all a person needs in order to form a reasonable idea of what to do with his or her life. So the sense of the phrase "confidently

predict the job market" that would make premise 1 true would probably make premise 2 false. Similarly, the phrase "reasonable idea" could be seen as shifting in meaning from premise 2 to premise 3.

2g. RECONSTRUCTION:

*(1) If happiness involved freedom, then newborn children would be free (or would become free as they grow older).*

*(2) Newborn children are not free (nor do they become free as they grow older).*

---

*∴ Happiness does not involve freedom.*

ASSESSMENT: The argument is valid. Two senses of "freedom" can be distinguished. Children are free, as Rousseau suggests, when they are subjected to few, if any, social expectations. As we grow up, society increasingly expects us to play socially defined roles. The author of the passage, B. F. Skinner, stresses a second sense of freedom, acting without constraint of physical environment or genetic endowment. According to Skinner, no one is free in this way. But if he asserted this conclusion without explaining his special meaning of "freedom," he would be guilty of misleading definition.

**Exercise 7.2 (pp. 211–212)**

1. A figure is a square *if and only if*
   (1) It has four sides; and
   (2) Its sides are equal in length.
3. A law is just *if and only if* it was passed democratically.
5. An event is a traffic gridlock *if and only if*
   (1) It involves total standstill of traffic;
   (2) It lasts at least fifteen minutes; and
   (3) It extends eight blocks or more in any direction.
7. Something is a work of art *if and only if*
   (1) It is man-made; and
   (2) Some society or sub-group of a society has conferred the status of candidate for appreciation.
9. A person has (positive) liberty *if and only if* he or she is self-directed.

(*Note*: Berlin offers what seem to be several conditions, but they are essentially the same though they are expressed in different ways. It is somewhat arbitrary which one is stated in the reconstruction.)

**Exercise 7.3 (pp. 217–219)**

1a. COUNTEREXAMPLE: A parallelogram can have four equal sides but not be square.

1c. COUNTEREXAMPLE: Prisoners in adjacent cells live close to each other but may not constitute a society.

1e. COUNTEREXAMPLE: Some people have several compulsions. A person might believe that time spent gambling or drinking fine wines is worthwhile and still be a compulsive programmer.

1g. COUNTEREXAMPLE: A person might be intelligent but have never taken the Stanford-Binet IQ tests or have been ill when taking the tests and got a score lower than 130.

1i. COUNTEREXAMPLE: At one point in history the belief that the sun goes around the earth was accepted by most people and was supported by some evidence—the sunrise—but was not true.

1k. COUNTEREXAMPLE: A person who recklessly exposes himself to certain death in order to try to do the impossible act of holding back floodwaters that threaten a town is not courageous but foolhardy.

2a. The theory does not elucidate. "Follows from" is unclear. It could mean either that the conclusion is brought to mind by the premises or that its truth is guaranteed by the premises.

2c. Theory does elucidate. "Happiness" is surely better understood than "good," although it too requires some explanation.

2e. The theory does not really elucidate. "Fair" is somewhat more clear than "just," but it is still an ethical concept over which there would be considerable disagreement.

2g. Theory does elucidate. Although it uses technical terms, their meanings are independent of the meaning of "arc."

2i. The theory elucidates only a little. "Transmission of information" is somewhat clearer than "communicates," but not much.

2k. The theory does not really elucidate. It is debatable whether "find worthy or valuable" is more clear than "appreciate."

3a. Although the conditions are not contradictory, they might be incompatible if as a matter of social psychology, people don't really want to do what we help them to do to realize their potential. After all, not everyone wants to exert the effort to get the most out of their education. It seems likely that at least some people will not do what is necessary to realize their potential unless society intervenes to force or at least manipulate them into activities that help them to do so.

**Exercise 7.4 (pp. 221–227)**

1a. CONCEPTUAL THEORY: Something is right *if and only if* it is in the interest of the stronger.

CRITICISM: The expression "interest of the stronger" needs elucidation. If we interpret "stronger" to mean political rulers, as Plato points out in *The Republic*, then one important issue is whether we are talking about the real interest of the rulers or what they believe is in their interest. Even though justice may be in the real interest of rulers, counterexamples can be found in which what rulers believe is in their interest is not right. Hitler presumably believed that the concentration camps were in his (and Germany's) best interest, but that did not make them right.

1c. CONCEPTUAL THEORY: An action is morally right *if and only if* it produces more good than any available alternative. Something is good *if and only if* it produces pleasure in normal individuals.

CRITICISM: This version of utilitarianism faces counterexamples. An act might produce more good than any alternative but might distribute the goods so unfairly that some other act would be morally preferable (for example, telling a joke that thoroughly amuses most of those present but humiliates one person). Even giving the death penalty to a person known by a few insiders to be innocent (a scapegoat) might prevent an angry mob from rioting. In such a case, this alternative produces more pleasure than any alternative, but it is not just. Furthermore, proving a complex mathematical theory may be a good even if it does not produce (bodily) pleasure in a normal person or even in the mathematician who does so. The concept of pleasure and the methods of measuring it need elucidation. It is probably too narrow a concept to cover all things that are good.

1e. CONCEPTUAL THEORY: Something is human *if and only if*

(1) Its IQ is at least twenty;

(2) It has self-awareness;

(3) It has self-control;

(4) It has a sense of time; and

(5) It is capable of relating to others.

CRITICISM: The theory is not elucidating. The way in which humans have self-awareness and self-control, but other animals do not, is hardly more clear than is the distinction between humans and animals to begin with. Furthermore, there is a possible counterexample: there may well be extraterrestrial beings who satisfy the conditions but are not human.

2a. CONCEPTUAL THEORY: A work of art is modern *if and only if* it was created recently (in this century).

ARGUMENT:

(*1*) *The Museum of Modem Art should show only modern art.*

*(2) A work of art is modern only if it was created recently (in this century).* (FROM THEORY)

*(3) French Impressionist works of art were not created in this century.*

---

*∴ The Museum of Modern Art should not show French Impressionists.*

CRITICISM: The term "modern" reflects the style of the art, not the precise point in time at which it was created. In this sense of style, recent works can be done in traditional styles and not be modern in the stylistic sense. Native American totem art is not of the "modern" style even though it is still being created today.

2c. CONCEPTUAL THEORY: An argument is <u>good</u> *if and only if* it has a true conclusion.

ARGUMENT:

*(1) All valid arguments are good arguments.*

*(2) All good arguments have a true conclusion.* (IMPLICIT FROM THEORY)

---

*∴ All valid arguments have a true conclusion.*

CRITICISM: The conceptual theory about the goodness of an argument underlies the second, implicit premise. But this theory could be challenged by pointing out that certain deductive arguments—the valid ones—are good structurally even though they may have a false conclusion and that good inductive arguments, as we will see in chapter 8, need not have a true conclusion. If the theory is faulty, then premise 2 is questionable, and the soundness of the argument is in doubt. Furthermore, premise 1 is weak if "good" is taken as meaning "without defect." A valid argument could have the defect of false premises and conclusion. Incidentally, the argument itself is an example of a valid argument with a false conclusion.

3a. CONCEPTUAL THEORY: An object is a work of art if and only if it is put forward as a candidate for appreciation by people who constitute the art world. A person is a member of the art world if and only if her life and social relations are dedicated to creating, identifying, assessing, and evaluating objects as works of art.

SOME (OF A WIDE VARIETY) OF SAMPLE IMPLICATIONS:

(i) Given the right circumstances, even an old, well-used urinal could be a work of art.

(ii) If a person consciously sets out to create a work of art, she needs to have some idea about the standards of the art world.

ARGUMENT FOR (i):

*(1) An old, well-used urinal can be put forward as a candidate for appreciation (as, for instance, when the French artist Duchamp did so in order to shock his contemporaries).*

*(2) If something is put forward as a candidate for appreciation by a member of the art world, then it is a work of art.* (FROM THE CONCEPTUAL THEORY)

---

*∴ Given the right circumstances, even an old, well-used urinal could be a work of art.*

ARGUMENT FOR (ii):

*(1) If a person consciously sets out to create a work of art, then she is consciously setting out to create something that can be put forward as a candidate for appreciation by the art world.* (FROM THE CONCEPTUAL THEORY)

*(2) If somebody consciously sets out to do so, then she needs to have some idea about the standards of the art world.*

---

*∴ If a person consciously sets out to create a work of art, she needs to have some idea about the standards of the art world.*

## Chapter 8

### Exercise 8.1 (pp. 234–235)

1a. Particular; 1c. Generalization, statistical; 1e. Generalization, universal

1g. Generalization, statistical; li. Particular; 1k. Generalization, universal

1m. Generalization, universal

2a. Inductive, argument with statistical premise; 2c. Inductive, argument with statistical premise; 2e. Inductive, sampling argument, then application with argument from statistical premise or deductive argument; 2g. Deductive; 2i. Inductive, sampling argument (perhaps inductive, argument with statistical premise at the end of the passage); 2k. Deductive

### Exercise 8.2 (pp. 242–246)

1a. *(1) Teachers in all three courses she has taken are men.*

---

*(likely) Most university teachers are men.*

Too small a sample. A better sample could be obtained by getting data from a random sample of universities; better yet, we could consult data collected and published by the Department of Education.

1c. *(1) An insufficient number of those sampled said that they would vote for Roosevelt.*

---

*(likely) An insufficient number of voters would vote for Roosevelt to elect him.*

The sample is not representative; the less well-to-do would be less likely to read *Literary Digest* or to have a telephone or an automobile, especially during the Depression. A random sample of addresses for registered voters (those likely to vote) would have produced better results, but the data would have been difficult to obtain for the country as a whole. This is a "classic" example of a very large sample that fails to support an inductive inference because it is not representative.

1e. *(1) The National Football Conference has won more cross-conference and Super Bowl games than the American Football Conference in recent seasons.*

---

*(likely) The NFC will win more cross-conference and Super Bowl games than the AFC in future seasons.*

The sample may not be representative of future seasons, when the college draft might equalize the league or when restrictions on the number of players might make better players more generally available. A better sample might include records from a longer period of time.

1g. *(1) Most of those randomly selected people who were being treated for gout in the San Francisco area were not addicted to rich gourmet food and beverages.*

---

*(likely) Most gout sufferers are not addicts of rich gourmet food and beverages.*

The sample may not be representative of all gout sufferers. A wider range of cities with various ethnic and cultural characteristics might be sampled.

1i. *(1) The [sample of?] guys down at the Beta fraternity house and Bernie's Tavern [who are bachelors] are all unhappy.*

---

*(likely) All bachelors are unhappy.*

The sample is not representative of all unmarried men. A sample with a broader range of ages, social backgrounds, and cultural values would be better.

1k. (Among other arguments that generalize)

*(1) A fifth of the 1,500 women surveyed at Harvard [said they] had been forced into sexual activity.*

---

*(likely) Sex is forced on 19 percent (about a fifth) of all college women. [At Harvard?] [In the United States?]*

It is unclear whether the sample was random or not. If it was taken from those using the health services, for example, they might be unrepresentative of the whole population. It is also unclear whether the article wishes to generalize to a larger college population outside Harvard. If so, the sample must be taken from other colleges and universities as well.

2a. Suppose it were argued that the percentage of minority group members in the United States is not increasing. The census report provides an estimate of the number of minority members for selected minority groups. Some urban minorities are apt to be undercounted because of a more mobile lifestyle—they might not be home much—or because they avoid government agents (for example, illegal aliens).

2c. An interview with individuals in randomly selected households in the neighborhood would be appropriate. Such an interview might be more easily done by telephone, given the emotional nature of the debate, though obtaining the telephone number of the household would be difficult. Care must be taken to avoid oversampling of one gender, perhaps by randomly asking for either a male or a female respondent from the household.

2e. Readings from monitors distributed in representative areas of the city could be used.

**Exercise 8.3 (pp. 259–264)**

1. Both heavy consumption of coffee and heart attacks might be joint effects of the same underlying cause—for example, a compulsive, hard-driving personality.

3. Going to the hospital and dying have an underlying cause—namely, some disease or injury that might account for both. There are, however, a variety of hospital-contracted infections that could in fact cause an elevated death rate for certain classes of patients.

5. Given the variety of types of studies underlying the correlation, the move of a cause is probably justified, though it is possible that both cancer and smoking spring from some underlying physical cause.

**Exercise 8.4 (p. 269)**

1. COUNTERARGUMENT:

   *(1) Few drivers are drunk at 9:30 on Sunday morning.*

   *(2) Armand was in an auto fatality at 9:30 on Sunday morning.*

   ---

   *(likely) Armand's death was not the result of the drinking driver.*

3. COUNTERARGUMENT:

   *(1) Most clerical jobs have lower wages.*

   *(2) American cities with a strong service economy have a great many clerical jobs.*

   ---

   *(likely) American cities with a strong service economy have lower wages.*

**Exercise 8.5 (pp. 273–275)**

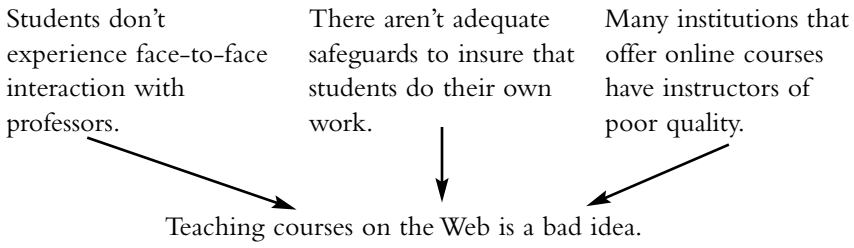
1. A difference between the captain of a ship and the president of a country that makes the conclusion less likely is that the captain is supposedly an expert at handling his ship in all situations. An elected president may not be an expert at statecraft and may be unfamiliar with the kinds of crises that might confront him.

3. The implicit conclusion is that a government can't go on spending more than it takes in. One difference between a family and a government that makes the conclusion less likely is that a family has little or no control over the economic system in which it operates. For example, a government could affect the rate of interest on its debts through monetary policy, but a family could not. Furthermore, the premise that a family can't go on spending more than it takes in is somewhat doubtful. A family could do this for a long time, as long as it can pay the interest on its debt.

5. Rented tuxedos sometimes do fit. It is only if you abide by the myth of the perfect fit that you might think otherwise. Similarly, analogies might fit very well indeed.

**Exercise 8.6 (p. 284)**

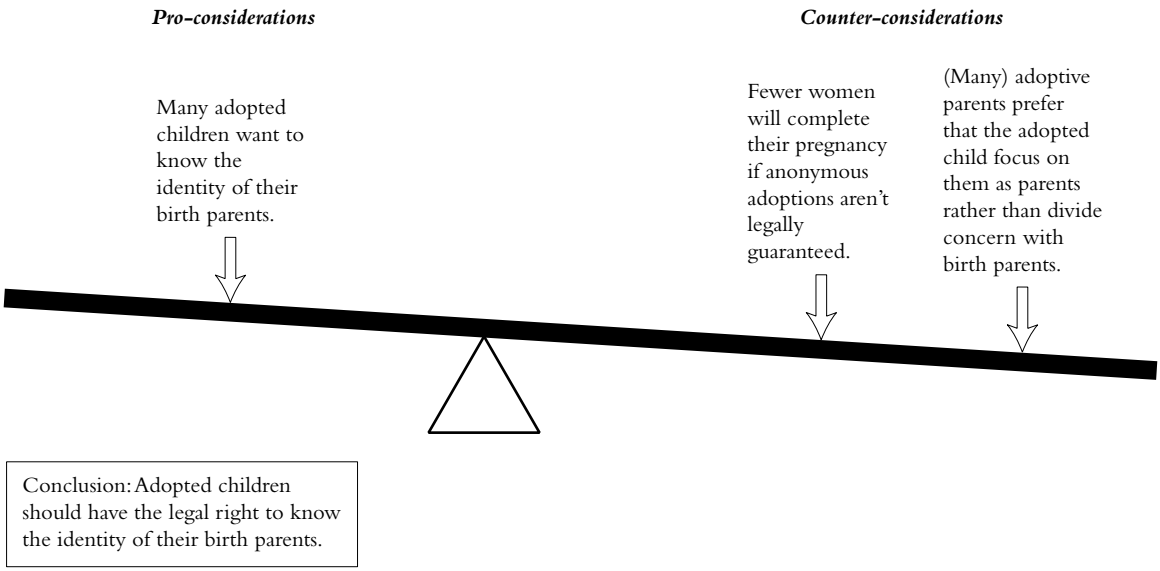
1a.


Students don't experience face-to-face interaction with professors.
There aren't adequate safeguards to insure that students do their own work.
Many institutions that offer online courses have instructors of poor quality.
Teaching courses on the Web is a bad idea.

Assessment: Blunting a Consideration. Evidence would need to determine that instructors on the Web are poorer on the whole than those who teach classes face-to-face. Indeed, the quality of Web courses might be higher during the initial stage of development than at some later point if Web courses become widespread. Also it is not clear that the safeguards are especially inadequate. Cheating is a problem in other teaching modes as well.

The passage does not offer any considerations in favor of teaching courses on the Web, but we might add that the Web can provide education to "place bound" students who can't attend regular classes, Web-based learning allows for flexibile scheduling of course work, and furthermore, e-mail interaction with faculty, while not face-to-face, may be more personal than sitting in a large lecture hall in a standard university setting.

1c.


Pro-considerations
Counter-considerations
Many adopted children want to know the identity of their birth parents.
Fewer women will complete their pregnancy if anonymous adoptions aren't legally guaranteed.
(Many) adoptive parents prefer that the adopted child focus on them as parents rather than divide concern with birth parents.
Conclusion: Adopted children should have the legal right to know the identity of their birth parents.

*Alternatively: The argument in the passage might be reconstructed with the conclusion that adopted children should not have the legal right to know the identity of their birth parents. In which case, the two considerations on the right above would be placed on the left and the balance line would be shifted in the other direction.*

Assessment: Blunting Considerations. The stigma of having put up a child for adoption is not as great as it might have been in the past. To change the law (at least for future adoptions) might not affect whether pregnancies would be carried to term as suggested.

Promoting a Consideration: It is not just a matter of adopted children wanting to know for frivolous reasons (as might be suggested in the passage) but for sound psychological and even health reasons. Recent advances in medicine makes knowing the biological family's medical history particularly important.

## Chapter 9

### Exercise 9.1 (pp. 295–300)

1a. Statement 2 explains statement 1.

1c. Statement 2 explains statement 1.

1e. Statement 1 explains statement 2.

2a. WHAT IS EXPLAINED: Why so many banks are failing.
THEORY: Deregulation has resulted in bankers taking more risks.

2c. WHAT IS EXPLAINED: German genocide during the Holocaust.
THEORY: (two versions)
INTENTIONALIST: Hitler and his closest aides had an explicit long-term plan for extermination.
FUNCTIONALIST: The decision was the result of a struggle among rivals to gain Hitler's approval (not the result of a long-term plan).

2e. WHAT IS EXPLAINED: Why the U.S. Constitution survived.
THEORY: The Constitution was frequently altered to confer benefits and handicaps more in harmony with social balance of power.

2g. WHAT IS EXPLAINED: Why there as been a temperature increase of about 0.5 degrees over the last 100 years.
THEORY: The earth is subject to continual temperature oscillations (climate does not stay the same for long).

The theory is put forward as an alternative to the Greenhouse theory, which is meant to "explain" significant temperature increase. The author contends that the actual increase is not as significant as the Greenhouse theory predicts. Her theory accounts for changes in temperature as normal oscillations rather than the buildup of "greenhouse" gases.

2i. WHAT IS EXPLAINED: Why the Christian faith obtained (so remarkable) a victory (that is, why it spread and became established in much of Europe and the Mediterranean).
THEORY: There were five underlying causes: (a) a more inviting but nevertheless inflexible and intolerant zeal, (b) the doctrine of future life, (c) miraculous power ascribed to the primitive church, (d) pure and austere morals, and (e) connection to politics within the Roman Empire.

2k. WHAT IS EXPLAINED: Why smoking is associated with increased death from disease.
THEORY 1: Nonsmokers (or light smokers) are biologically self-protective, and this reduces the effects of stress.

THEORY 2: Smoking ages smokers, and aging (not smoking) causes disease. (*Note:* The first "explanation" mentioned in the text is that there really is no association to be explained.)

**Exercise 9.2 (pp. 303–308)**

**Passage 1**

| **Initial Theory Being Evaluated** | **Alternatives** |
|---|---|
| Younger Americans are reacting in a perfectly rational manner to their circumstances. | The regularity could be explained by the (four) alternative theories mentioned:<br>i. TV watching has produced cynicism<br>ii. Reagan/Bush presidencies fostered government-bashing<br>iii. Breakdown of the traditional family<br>iv. Incessant political scandals<br><br>Others might be added, such as economic prosperty has fostered a more individualistic (Libertarian) attitude that is suspicious of collective political action. |
| **Regularity Being Explained by Both Initial Theory and Alternatives** | **Predicted Regularities That Might Not Occur** |
| Generation X is politically apathetic. | If the initial theory is true, candidates that explicitly mention these issues cited in the passage get a larger percentage of the Generation X vote. If such candidates get elected, Xers should become more politically active. |

**Passage 3**

| **Initial Theory Being Evaluated** | **Alternatives** |
|---|---|
| Suicide is caused by unrelieved anxiety and stress. Social cohesion relieves anxiety and stress. | Regularity 1 could be explained by pointing out that Catholicism (especially in nineteenth century) strongly disapproved of suicide.<br><br>Regularity 2 could be explained by the fact that many people live alone because they have serious problems, e.g., alcoholism or serious mental disorders. |

**Regularities Being Explained by Both Initial Theory and Alternatives**

1. Catholics have lower (recorded) suicide than Protestants.
2. Married persons living with a spouse have a lower (recorded) suicide rate than people living alone.

**Predicted Regularities That Might Not Occur**

The initial theory predicts that youths living at home should have a lower suicide rate than other segments of society.

People who live by themselves should have more frequent visits to helping professionals or show other signs of stress.

**Exercise 9.3 (pp. 310–315)**

1a. (i) Theory: Psi phenomena (true psychics) exist.

(ii) Criticism: Psychics don't break the bank in Las Vegas casinos (make a notable difference to casino profits).

(iii) Defense: Few psychics would be expected to be good, consistent gamblers, and we probably won't find out about those few who did win from casinos.

(iv) The defense does seem *ad hoc.* Great success at gambling would seem to be a good way at gaining popular (if not scientific) support for the position. The opportunity for quick wealth would surely be an incentive for many psychics to become good, consistent gamblers.

1c. (i) Theory: Darwinian evolutionary theory

(ii) Criticism: Transitional evolutionary forms ("missing links") are extremely rare.

(iii) Defense: Darwinian theory should be altered by a non-gradualistic theory of evolution in which there are long periods of stasis (no change) and short periods of rapid evolutionary change.

(iv) The response need not be seen as *ad hoc* depending on how well the non-gradualist account can be supported.

1e. (i) Theory: Creationism (earth was created by God a relatively short time ago.)

(ii) Criticism: Radioisotope dating suggests the earth is very old.

(iii) Defense: Add to creationism the following items: radioisotope decay has not been constant, samples of decay products tested may be systematically contaminated by extra portions of that from which they decayed (the parent) or extra portions of decay product itself (the daughter), and God might have created the misleading array of radioisotopes.

(iv) The defense seems *ad hoc,* especially the last item. It is unrealistic to believe that the effects of contamination would systematically correlate with dating determined by other means such as historical records and tree rings. Why should we assume God would deceive us in this way?

2a. We might test the theory that personal space exists (or that it is tied to various characteristics) by determining whether people consistently react (for example, move away or say something) whenever another person (especially a stranger) enters the region.

2c. It is unclear how we could test the theory that God created the world with the (misleading) fossils in it since any evidence (or at least any fossil evidence) is irrelevant. It is not clear what other kind of evidence would be relevant unless a method such as carbon dating was also altered.

2e. The theory that hip items must be rare and can't be commercialized (made common) could be tested by making some hip item from some trend-setting region (e.g., New York or San Francisco) common in a non-trend-setting region, and see whether it remained hip.

2g. The theory that the dead communicate by phone with the living can't easily be tested, especially when it includes the claim that the call ends when someone realizes that he is speaking to a dead person. We would have to have some other way of communicating with the dead in order to determine whether the messages are indeed accurate.

**Exercise 9.4 (pp. 316–326)**

**Passage 1**

Theory: Handguns in private hands (in the United States) protect property and lives.

Regularity: U.S. criminals engage in murder, rape, and robbery at a higher rate than other countries, but the United States has a lower burglary rate than these other countries.

Sample Criticism

Alternative Theory: Much of the violent crime in the United States is related to drugs. Both the drug trafficker and especially the addict act precipitously and often violently without the premeditation needed for successful burglary. The United States may have better alarm systems, security, and other protection against burglary than other countries.

Doubtful Prediction: The burglary rate is lowest in those areas with the highest gun ownership.

**Passage 3**

Theory: (International) politics is becoming feminized.

Regularity: Countries are becoming less inclined to use power around the world as freely as they have.

Sample Criticism
Alternative Theory: The threat of nuclear weapons (and more recently chemical and biological weapons) has made wide-scale military action more risky. The failure of the United States in Vietnam, and Russia in Afghanistan have weakened resolve. The civil and ethnic conflicts around the world are difficult and dangerous to settle, and hence make the larger nations increasingly reluctant to intervene.

Doubtful Prediction: Organizations with a large number of women involved are less oriented to use power. (Militancy can be found within the womens' movement as well as among fundamentalist Christian organizations with a large female membership.)

**Exercise 9.5 (pp. 332–339)**

1. "A Star Named George":

$T_1$ The sun is a member of a binary-star system with a faint dwarf star about one-tenth of the sun's mass at a distance of 2.4 light-years.

$T_2$ Passage of a star through the inner Oort cloud would cause comets to rain down on the earth.

$T_3$ Comets hitting the earth would spread enough extraterrestrial material and dust to darken the earth's atmosphere for at least six months (the Alvarez hypothesis).

$T_4$ Darkening of the earth's atmosphere for an appreciable period of time would cause mass extinctions.

$R_1$ The rate of extinctions increases systematically every 26 million years, with the last occurring some 13 million years ago.

$O_1^1$, $O_1^2$, $O_1^3$ Data examined by Raup and Sepkoski.

$R_2$ [Unanticipated] Comet showers show impact craters occur about every 28.4 million years.

$O_2^1$ Alvarez's data on iridium.
$O_2^2$ Muller and Alvarez's data on thirteen impact craters.

## Chapter 10

### Exercise 10.1 (pp. 358–363)

3c. Two of Silber's arguments can be stated as follows. A few criticisms are noted. Argument I:

*(1) Indiscriminate taking of human life is wrong.*

*(2) If a woman who became pregnant voluntarily and whose life is not threatened by her pregnancy has an abortion, then she is taking life indiscriminately.*

---

*∴ To have an abortion after becoming pregnant voluntarily and when one's life is not threatened by the pregnancy is wrong.*

The conclusion follows, but it is questionable whether, for example, having an abortion when one's emotional well-being is severely threatened by the pregnancy is taking life indiscriminately.

Argument II:

*(1) Abortion is a moral and religious issue with no consensus.*

*(2) If an issue is moral and religious with no consensus, then the state shouldn't impose legal restrictions concerning it.*

---

*∴ The state shouldn't impose further legal restrictions concerning abortion.*

The conclusion doesn't follow. What would follow is that the state shouldn't impose *any* legal restrictions concerning abortion, not that it shouldn't impose *further* legal restrictions. Silber might reply that there is enough consensus to justify the *Roe vs. Wade* guidelines. The argument could be reconstructed accordingly but still would be open to criticism.

### Exercise 10.2 (pp. 365–372)

3. The passage suggests the following argument, which contains as a premise the assertion of a theoretical explanation of a regularity. The argument can be stated:

*(1) American university students have become passive, disconsolate, indifferent, and overly subject to technical authority because the American university offers no unified vision.* (FROM THE EMPIRICAL THEORY)

*(2) If (1), then the American university should be transformed.*

---

*∴ The American university should be transformed.*

STATEMENTS OF THEORY AND REGULARITIES:

$T_1$ The American university no longer offers students a unified vision (prejudice). (It is a collection of independent, specialized departments that are not tied together by debates about values.)

$R_1$ American university students have become passive, disconsolate, indifferent, and overly subject to (technical) authority.

SAMPLE CRITICISMS OF THE THEORETICAL EXPLANATION ASSERTED IN FIRST PREMISE:

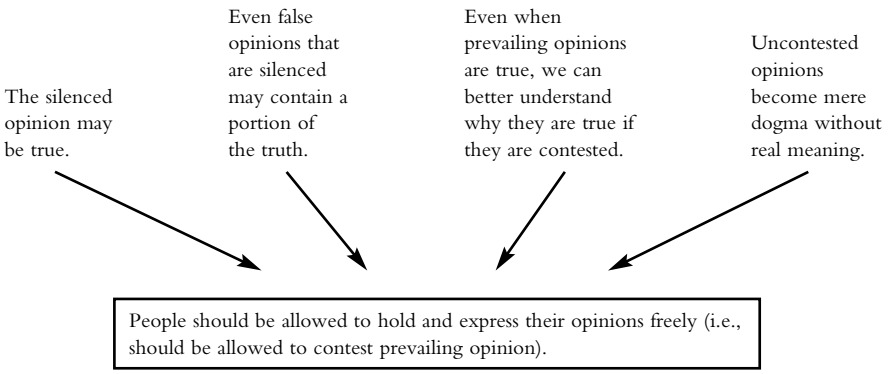
(1) Alternative theory: The transformation in students that Bloom notes might well be a result of much broader social and cultural factors. The country as a whole during the 1970s and 1980s became less socially conscious, less engaged. The apparent moral concerns of the 1960s were displaced.

(2) Alternative theory: Cognitive and moral development of college-age students might well follow some predictable stages, as suggested by William Perry in Forms of Intellectual and Ethical Development in the College Years. If so, a period of relativism or lack of prejudice may be a necessary or at least efficacious precursor to more sophisticated, yet value-committed, intellectual positions.

(3) Doubtful prediction: Universities with more traditional "great books" curriculum should have students who are more engaged.

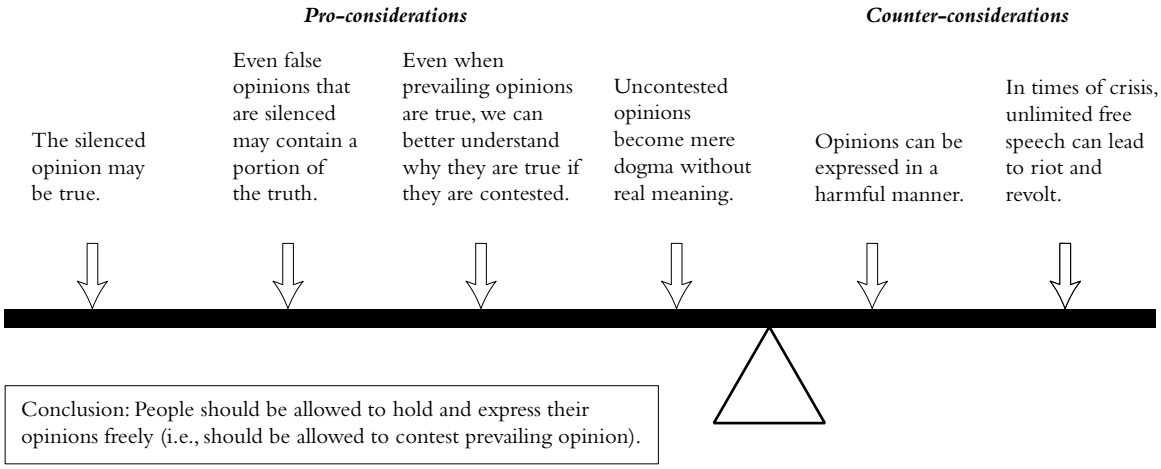
**Exercise 10.3 (pp. 376–381)**

As a Convergent Argument (Note that some of the premises are themselves conclusions of linked arguments in the passage.)


The silenced opinion may be true.
Even false opinions that are silenced may contain a portion of the truth.
Even when prevailing opinions are true, we can better understand why they are true if they are contested.
Uncontested opinions become mere dogma without real meaning.
People should be allowed to hold and express their opinions freely (i.e., should be allowed to contest prevailing opinion).

Evaluation of the Convergent Argument

Adding Considerations: The author of this famous passage, John Stuart Mill, raises later in his essay the counter-consideration that some would call for restrictions on the manner in which dissenting opinions are expressed. Along these lines, contemporary discussion of this issue of free expression has raised the question of whether expressions such as racial slurs and other insulting or hateful speech should not be censored because of the harm it causes. In addition, a critic could argue that in times of national crisis, allowing unlimited free speech might lead to riot or revolt. We could re-present all the considerations that have now been raised in a new diagram:


Pro-considerations
Counter-considerations
The silenced opinion may be true.
Even false opinions that are silenced may contain a portion of the truth.
Even when prevailing opinions are true, we can better understand why they are true if they are contested.
Uncontested opinions become mere dogma without real meaning.
Opinions can be expressed in a harmful manner.
In times of crisis, unlimited free speech can lead to riot and revolt.
Conclusion: People should be allowed to hold and express their opinions freely (i.e., should be allowed to contest prevailing opinion).

Even though the counter-considerations might incline us to some carefully specified restrictions on free expression, we find Mill's argument on the whole to be a strong one.